

Publications: More than 475 Journal Publications and Book Publications scientific manuscripts were published in peer reviewed medical journals from these research studies.

A full list of published work is available here:

<https://pubmed.ncbi.nlm.nih.gov/?term=Kumarasamy+n+OR+Nagalingeswaran+K>

Publications:

- 1) **N.Kumarasamy**, Suniti Solomon, S.A. Jayaker Paul, Rosy Vennila, R. Edwin Amalraj. Spectrum of Opportunistic infection among AIDS patients in Tamilnadu, India. International Journal of STD and AIDS. 1995; 6:447 - 449.
- 2) Suniti Solomon, **N.Kumarasamy**, S. Anuradha, Rosy Vennila, S.A. Jayaker Paul. Tuberculosis and HIV infection - An Association. Indian Journal of Medical Microbiology. 1994; 12(4) 313-314.
- 3) **N.Kumarasamy**, Suniti Solomon, S.A. Jayaker Paul, R. Edwin Amalraj, S. Sridhar. Neurological Manifestations in AIDS patients in South India. Journal of Neuroimmunology. 1995; 63:100.
- 4) **N.Kumarasamy**, Suniti Solomon, Patrick Yesudian, Sugumar. First report of Kaposi's Sarcoma in an AIDS patient from Madras, India. Indian Journal of Dermatology 1996; 41(1) 23-25.
- 5) Suniti Solomon, **N.Kumarasamy**, SP Martin, R. Pandian, K. Sathyamoothy, SP Thyagarajan. Analysis of Risk factors and Evaluation of HIV testing in Saliva and Blood samples. Journal of Infection. 34/1 (1997), p.85-86.
- 6) Suniti Solomon, **N.Kumarasamy**, AK.Ganesh, R. Edwin Amalraj. Prevalence and risk factors of HIV-1 and HIV-2 infection in urban and rural areas in Tamilnadu, India. Int. J STD & AIDS 1998; 9: 98-103.
- 7) J Biswas, Hajib N Madhavan, **N.Kumarasamy**, Suniti Solomon. Blepharitis and Lid Ulcer as Initial Ocular manifestation in Acquired Immunodeficiency Syndrome Patients Indian J Ophthalmology Vol.45 No4 Dec 1997. p233-234.
- 8) **N.Kumarasamy**, Suniti Solomon, A.K.Ganesh, R.Edwin Amalraj, S.P.Thyagarajan. Clinical Characterization of Persons with HIV and Tuberculosis in South India. AIDS 1996 (10) Suppl 2: S41.
- 9) Jyotirmoy Biswas, Lily Therese, **N.Kumarasamy**, Suniti Solomon, Patrick Yesudian. Lid abscess with Extensive Molluscum Contagiosum in a Patient with Acquired Immunodeficiency Syndrome. Indian J Ophthalmology Vol.45 No4 Dec 1997. p234-235
- 10) M.M.Usha, P.Rajendran, SP.Thyagarajan, Suniti Solomon, **N.Kumarasamy**, Tokugha Yephthomi, Usha Ananda Rao, NM.Pramod, P.Balakrishnan. Identification of

Pneumocystis carinii in induced sputum of AIDS patients in Chennai. Ind J Path Microbiol. 43 (3):291-296,2000.

- 11) Jyotirmoy Biswas, Seemant Raizada, Lingam Gopal, **N.Kumarasamy**, Suniti Solomon. Bilateral Frosted Branch Angitis and Cytomegalovirus Retinitis in Acquired Immunodeficiency Syndrome. Indian Journal of Ophthalmology. Vol.47: No 3; 1999 :195-197
- 12) Jyotirmoy Biswas, Amala Joseph, Seemant Raizada, **N.Kumarasamy**, Suniti Solomon. Ophthalmic Manifestations of Human Immunodeficiency Virus (HIV) in India. Indian Journal of Ophthalmology 1999;47:79-85.
- 13) S.Kamatchiammal, D.Saravanakumar, **N.Kumarasamy**, Suniti Solomon, Manjula, V.Sritharan. A Simple Method for Inhibition Free PCR amplification of target DNA directly from Clinical Specimens. Indian Journal of Clinical Biochemistry, 1997, 12 (1), 78-80.
- 14) **N.Kumarasamy**, Suniti Solomon, Purnima, B.Ravikumar, R Edwin Amalraj, SP Thyagarajan. Effects of Trimethoprim Sulphamethoxazole prophylaxis in Persons with HIV disease in South India. AIDS Vol 12 Suppl 4 November 1998, S97.
- 15) Rajani R Battu, J.Biswas, Navin Jaikumar, Hajib N Madhavan, **N.Kumarasamy**, Suniti Solomon. Papilloedema with peripapillary Retinal hemorrhages in an AIDS patient with Cryptococcal meningitis.Ind J Ophthalmology. 2000; 48 : 47-49.
- 16) Amala E.George, J.Biswas, Rajat Agarwal, **N.Kumarasamy**, Suniti Solomon. Subretinal Cysticercosis in a patient with AIDS - Treatment with Xenon ARC Photocoagulation. Retina,The Journal of Retinal and Vitreous Diseases. 1999; Vol 19 No5: 467-468.
- 17) Rajesh Fogla, J.Biswas, Krishna Kumar, H.N.Madhavan, **N.Kumarasamy**, Suniti Solomon. Squamous Cell Carcinoma of the conjunctiva as initial presenting sign in a patient of Acquired Syndrome (AIDS) due to HIV-2. Eye. (2000) 14, 246-247.
- 18) **N.Kumarasamy**, Suniti Solomon, Purnima M, B.Ravi Kumar,S.P.Thiagarajan, Patrick Yesudian. Dermatological Manifestations among HIV patients in South India. International Journal of Dermatology 2000 ; 39 :192-195.
- 19) B.Ravikumar,**N.Kumarasamy**, Purnima M, Suniti Solomon. Human Immunodeficiency virus infection in a health care worker (HCW) as an occupational hazard...an eye opener. Indian J Med Microbiology. (1999) 17(2): 96.
- 20) **N Kumarasamy**, Suniti Solomon, Erica Peters, R Edwin Amalraj, Purnima M, B Ravikumar, Tokugha Yephthomi, SP Thyagarajan. The use of antiretroviral drugs in the

treatment of people living with HIV: the experience in a South Indian tertiary referral centre. *AIDS Research and Review* 1999, Vol.2 No.2. p95-98.

- 21) J.Biswas, H.N.Madhavan, Amala E George, **N.Kumarasamy**, Suniti Solomon. Ocular lesions associated with HIV infection in India: A series of 100 consecutive patients evaluated at a referral center. *Am J Ophthal.* Jan 2000 ;129: 9-15 .
- 22) K.Ranganathan, Venkat Ramana Reddy, J.Dinaker, , R.Viswanathan, R.Gunaseelan, **N.Kumarasamy**, Purnima M, , Suniti Solomon. Oral and Maxillofacial manifestations among HIV positive Children in Chennai, India. *J Ind Dental Association (JIDA)* Vol.69 Sep.-Dec.1998. P 260-263.
- 23) Sara Newman, Pooja Sarin, **N.Kumarasamy**, Maya Rogers, R.Edwin Amalraj, Rogers,Purnima M, T.Flanigan,Susan Cuvian, S.McGarvey, Suniti Solomon. Marriage, Monogamy and HIV: A profile of HIV-infected women in South India. *Int J STD and AIDS* . 11:250-253,2000.
- 24) **N.Kumarasamy**, Suniti Solomon, Erica Peters,R Edwin Amalraj, Purnima M, B Ravikumar,Tokugha Yepthomi, SP Thyagarajan. The use of antiretroviral drugs in the treatment of people living with HIV: The experience in a South Indian tertiary referral centre. *Journal of Association of Physicians of India.* 2000;48: 390-393.
- 25) K.Ranganathan, B.V.R.Reddy, **N.Kumarasamy**, Suniti Solomon, R.Viswanathan, N.W.Johnson. Oral lesions and conditions associated with HIV infection in 300 South Indian patients. *Oral Diseases.* (2000) 6,152-157.
- 26) Suniti Solomon, A.K.Ganesh, Maria Ekstrand, John Barclay, **N. Kumarasamy**, Jeffrey Mandel, Christina Lindan,. High HIV Seropositivity at an Anonymous Testing Site in Chennai, India: Client Profile and Trends over time. *AIDS and Behaviour*, Vol.4, No.1,2000: 71-81.
- 27) Surbhit Choudhary, J.Biswas, **N. Kumarasamy**, Suniti Solomon. Immune Recovery Vitritis presenting as Panuveitis following Highly Active Antiretroviral therapy - a case report. *Ind J Ophthal.* 2000;48:313-15.
- 28) J.Biswas, TK. Samanta, HN. Madhavan, **N.Kumarasamy**, S.Solomon. Acute panuveitis with haemorrhagic hypopyon as a presenting feature of acquired immunodeficiency syndrome. *Ind J Ophthal.* 2000; 48:311-12.
- 29) Satya Karna, J.Biswas, Navin Jayakumar, **N.Kumarasamy**, Praveen Sharma, Suniti Solomon. Multiple cranial nerve palsy in a HIV positive patient . *Ind J Ophthalmol* 2001;Vol.49.No.2: 8-10.

- 30) Purnima Madhivanan, Amutha Hari, **N.Kumarasamy**, A.Geetha, Kausalya, JS.Lambert, Suniti Solomon. Profile of HIV-infected pregnant women and the interventions to reduce vertical transmission at a tertiary HIV care center in South India. The Journal of Obstetrics and Gynaecology of India.2003
- 31) Thangam Menon, Uma Maheshwari, **N.Kumarasamy**, Suniti Solomon, S.P.Thyagarajan. Efficacy of Fluconazole and Itraconazole in the treatment of oral candidiasis in HIV patients. Acta Trop 2001; 80 (2) : 151-4.
- 32) J.Biswas,Aman Anup Kumar, Amala E George, HN Madhavan, **N.Kumarasamy**,SN Mothi,Suniti Solomon. Ocular and Systemic lesions in children with HIV. Indian Journal of Pediatrics, 2000;67 (10):611.
- 33) Tapan Kumar,Samanta, J Biswas, Lingam Gopal, AR.Anand, **N.Kumarasamy**, Suniti Solomon. Panophthalmitis due to Rhizopus in an AIDS Patient-A Clinicopathological study. Ind J Ophthal. 2001; 49:49-51.
- 34) Thangam Menon, **N.Kumarasamy**, Shilpa Sarang, M.Palani Kumar, Suniti Solomon, SP Thyagarajan. Penicillium pubhregenum infection in an AIDS patient- First report from South India.Ind J Sexually Transmitted Diseases 2002.
- 35) **N.Kumarasamy**, J.Biswas, Purnima Madhivanan, Tokugha Yepthomi, C.Venkatesan,Suniti Solomon. Immune recovery inflammatory syndrome in persons with HIV from South India. AIDS 2000,Vol 14 Supplement 4; S68:P179.
- 36) Purnima Madhivanan, SN Mothi, **N.Kumarasamy**, Tokugha Yepthomi, J.Lambert, Suniti Solomon. Regression of attained milestones in an HIV infected infant- A case report from Chennai, India. Ind J Pediatrics 2001; Vol 68: 991-3.
- 37) J.Biswas, Satyen Deka, S.Padmaja, H.N.Madhavan, **N.Kumarasamy**,Suniti Solomon. Central retinal vein occlusion due to herpes zoster as the initial presenting sign in a patient with acquired immunodeficiency syndrome. Ocular Immunology and Inflammation. 2001, Vol.9, No:1;1-6.
- 38) Purnima Madhivanan, SN Mothi, **N.Kumarasamy**, Tokugha Yepthomi, J.Lambert, Suniti Solomon. Clinical manifestations of HIV infected children at a tertiary HIV care centre IN South India. India. Ind J Pediatrics, August 2003; Vol 70 (8) : 615-620.
- 39) **N.Kumarasamy**, Suniti Solomon, Timothy Flanigan, R Hemalatha, SP Thyagarajan, Kenneth Mayer. Natural History of HIV disease in Southern India. Clin Infect Dis 2003 Jan 1;36(1):79-85.

- 40) K.Ranganathan, KT.Magesh, **N.Kumarasamy**, S.Solomon, R.Viswanathan, NW.Johnson. Periodontal status in HIV seropositive patients and normal controls in 136 South Indian patients. A comparative study using CPITN. Ind J Dental Research 2006. (In press)
- 41) **N.Kumarasamy**, Anish Mahajan, Timothy Flanigan, R.Hemalatha, Kenneth Mayer, Charles Carpenter, SP. Thyagarajan, Suniti Solomon. The Total Lymphocyte count (TLC) is a useful tool for Opportunistic infection prophylaxis in India and other resource- constrained countries. JAIDS 2002 .31:378-383.
- 42) J.Biswas, Rajesh Fogla, Lingam Gopal, KM Narayana, Alay Banker, **N.Kumarasamy**, HN Madhavan. Current Approaches to Diagnosis and Management of Ocular lesions in HIV patients. Indian J Ophthalmol 2002;50: 1-10.
- 43) **N.Kumarasamy**, Anish Mahajan, Timothy Flanigan, R.Hemalatha, Kenneth Mayer, Charles Carpenter, SP. Thyagarajan, Suniti Solomon. New approaches to monitoring HIV treatment in Developing countries. The Lancet-Infectious Diseases :Vol 2 Nov 2002;656-7.
- 44) **N.Kumarasamy**, Suniti Solomon, Sreekanth Chaguturu, Anish Mahajan, Timothy Flanigan, P.Balakrishnan, Kenneth Mayer. Safety, Tolerability and Effectiveness of Generic Antiretroviral Drug Regimens for HIV-infected patients in South India. AIDS 2003, Vol17 No15: 2267-9.
- 45) Suneeta Saghayam, Sreekanth K. Chaguturu, **N. Kumarasamy**, Suniti Solomon, Kenneth H. Mayer, Christine Wanke. Lipoatrophy is the Predominant Presentation of HIV-associated Lipodystrophy in Southern India. Clin Infect Dis. 2004 Jun 1;38(11):1646-7.
- 46) Suniti Solomon, Jessica Buck, Sreekanth Chaguturu, AK Ganesh and **N.Kumarasamy**.
- 47) Stopping HIV Before It Begins: Issues Faced by Women In India. Nature Immunology 2003.Vol4,No:8' 719-21.
- 48) P.Balakrishnan, **N.Kumarasamy**, S.Vidhya, Sreekanth Chauguturu, KG. Murugavel J.Anitha Cecelia, Timothy Flanigan, Kenneth Mayer, SP.Thyagarajan, Suniti Solomon. A simple monitoring of antiretroviral therapy with a signal amplification-boosted HIV-1 p24 antigen assay with heat-denatured plasma - An inexpensive marker alternative to tests for viral RNA PCR (submitted).
- 49) Balakrishnan P, Mandy Dunne, **N.Kumarasamy** , Suzanne Crowe, Subbulakshmi G, Ganesh AK, Cecelia AJ, Patricia Roth, Kenneth H. Mayer, Thyagarajan SP, Suniti Solomon. An inexpensive, simple and manual method of CD4 T- cell quantitation in

HIV infected individuals for use in developing countries. *J Acquir Immune Defic Syndr.* 2004 Aug 15;36(5):1006-1010.

- 50) **N.Kumarasamy**, Sreekanth Chaguturu, Kenneth Mayer, Suniti Solomon, Tokugha Yephthomi, P.Balakrishnan, Timothy Flanigan. Incidence of Immune Reconstitution Syndrome in HIV-TB co-infected patients after initiation of generic HAART in India. *J Acquir Immune Defic Syndr.* 2004 Dec 15;37(5):1574-1576.
- 51) Mahajan AP, Hogan JW, Snyder B, **Kumarasamy.N**, Mehta K, Solomon S, Carpenter CCJ, Mayer KH, Flanigan TP. Changes in Total Lymphocyte Count as a Surrogate for Changes in CD4 Count Following Initiation of HAART: Implications for Monitoring in Resource-Limited Settings. *J Acquir Immune Defic Syndr.* 2004 Apr 20;36(1):567-575.
- 52) M. Chatterjee Rogers, G. Gopalakrishnan, **N.Kumarasamy**, T.P. Flanigan, C.C.J. Carpenter, K. H. Mayer, S Solomon . HIV in couples in South India; Implications for prevention. *Int J STD AIDS.* 2005 Jun;16(6):442-5.
- 53) K.Ranganathan, M.Umadevi,TR Saraswathi, **N.Kumarasamy**, S.Solomon, N.Johnson. Oral lesions and conditions associated with HIV in 1000 South Indian patients. *Ann Acad Med Singapore.* 2004 Jul;33(4 Suppl):37-42.
- 54) Uma S, Balakrishnan P, Murugavel KG Srikrishnan AK, **Kumarasamy N**, Anand S, Anitha JC, Celetano D, Kenneth H. Mayer, Thyagarajan SP, Suniti Solomon. Bacterial vaginosis in women of low socioeconomic status living in slum areas in Chennai, India. *Sex Health.* 2006 Dec;3(4):297-8.
- 55) Uma S, Balakrishnan P, Murugavel KG, Srikrishnan AK, **Kumarasamy N**, Anitha JC, Anand S, Celetano D, Kenneth H. Mayer, Thyagarajan SP, Suniti Solomon. Bacterial Vaginosis in female Sex Workers in Chennai, India. *Sexual Health* 2005 2(4)261–262
- 56) **N.Kumarasamy**, Suniti Solomon, S Chauguturu, Anitha Cecelia, Timothy Flanigan, Kenneth H Mayer. The changing Natural History of HIV disease before and after the introduction of generic Antiretroviral therapy in Southern India. *Clin Infect Dis.* 2005 Nov 15;41(10):1525-8.
- 57) **N.Kumarasamy**. Generic antiretroviral drugs-will they be the answer to HIV in the developing world? *Lancet.* 2004 Jul 3;364(9428):3-4.
- 58) K.Ranganathan,TR Saraswathi, **N.Kumarasamy**, S.Solomon. Molluscum contagiosum in HIV infection: a case report. *Journal of Oral and Maxillo Facial Pathology.* Vol.8 issue1 Jan- Jun 2004. p26-28.
- 59) Jialun Zhou, **N. Kumarasamy**, Rossana Ditangco, Adeeba Kamarulzaman, Christopher KC Lee, Patrick CK Li, Nicholas I Paton, Praphan Phanuphak, Sanjay

Pujari, Asda Vibhagool, Wing-Wai Wong, Fujie Zhang, John Chuah, Kevin R Frost, David A Cooper AO, Matthew Law on behalf of the TREAT Asia HIV Observational Database. The TREAT Asia HIV Observational Database: baseline and retrospective data. *J Acquir Immune Defic Syndr*. 2005 Feb 1;38(2):174-179.

- 60) **N.Kumarasamy**, Snigdha Vallabhaneni, Timothy P. Flanigan, P.Balakrishnan, Anitha Cecelia, Charles C.J. Carpenter, Suniti Solomon, Kenneth H. Mayer. Rapid Viral Load Suppression Following Generic HAART in Southern Indian HIV-Infected Patients. *AIDS* 2005, Vol 19 No: 6 : 625-627
- 61) Jialun Zhou, **N. Kumarasamy** on behalf of the TREAT Asia HIV Observational Database. The TREAT Asia HIV Observational Database: Short term predictors of HIV disease in Asia and Pacific. *HIV Med* (2005), 6, 216-223.
- 62) Sunil S Solomon, **N.Kumarasamy**, David D Celentano, Anitha J Cecelia, Tokugha H Yepthomi, VP Arvind, Suniti Solomon .Reasons for hospital admissions among people living with HIV disease in South India between 1997-2003: Are they changing? *AIDS Care*. 2006 May;18(4):366-70.
- 63) Snigdha Vallabhaneni, **N Kumarasamy**, Edwin Wing, Timothy Flanigan. A Diagnostic Dilemma in an HIV/TB-Coinfected Patient on Antiretroviral Therapy and Antituberculosis Therapy . *AIDS Read*. 2005 Feb;15(2):72-5.
- 64) **N. Kumarasamy** , SnigdhaVallabhaneni , Timothy P. Flanigan, Kenneth H. Mayer , Suniti Solomon Clinical Profile of HIV in India. *Indian J Med Res*. 2005 Apr;121(4):377-94.
- 65) P.Balakrishnan,Suniti Solomon, **N.Kumarasamy**,Kenneth Mayer. Low cost monitoring of HIV infected individuals on HAART in developing countries. *Indian J Med Res*. 2005 Apr;121(4):345-55.
- 66) Steven A. Safren, **N. Kumarasamy**, Romolla James, Sudha Raminani , Suniti Solomon, Kenneth H. Mayer. ART adherence, demographic variables, and CD4 outcome among HIV-positive patients on antiretroviral therapy in Chennai, India. *AIDS Care*. 2005 Oct;17(7):853-62
- 67) Syed Iqbal H, Balakrishnan P, Sunil Suhas Solomon, Vidya S, Martin SP, Ameedha. L, **N.Kumarasamy**, Murugavel KG, Thyagarajan SP, Kenneth H. Mayer, Suniti Solomon. HIV-1 Western Blot Assay: What determines an indeterminate status? *Indian J Med Sci*. 2005 Oct;59(10):443-50.
- 68) **N. Kumarasamy**, Steven A. Safren, Sudha Raminani, Robert Pickard,Romola James, A.K. Sri Krishnan, Suniti Solomon, Kenneth H. Mayer . A qualitative examination of

barriers and facilitators to antiretroviral medication among HIV positive patients in Chennai, India . AIDS Patient Care STDS. 2005 Aug;19(8):526-37.

- 69) P.Balakrishnan, **N.Kumarasamy**, Rami Kantor, S.Solomon, S.Vidya, K.H.Mayer, T.Flanigan, SP.Thyagarajan, D.Katzenstein B. Ramratnam. HIV-1 genotypic variation in an antiretroviral naïve population in South India. AIDS Res Hum Retroviruses., 2005: Vol. 21, No. 4: 301-305
- 70) **N.Kumarasamy**, Snigdha Vallabhneni, P.Balakrishnan,Suniti Solomon. Monitoring constraints in Resource Limited Settings- An obstacle for Quality Antiretroviral Treatment- a case report. (Submitted).
- 71) **N.Kumarasamy** , Venkatesh KK, Cecelia AJ, Devaleenal B, Lai AR, Saghayam S, Balakrishnan P, Yepthomi T, Poongulali S, Flanigan TP, Solomon S, Mayer KH. Spectrum of Adverse Events After Generic HAART in Southern Indian HIV-Infected Patients. AIDS Patient Care STDS. 2008 Apr;22(4):337-44.
- 72) **N.Kumarasamy**, Snigdha Vallabhneni, Anitha J. Cecelia, Tokugha Yepthomi, Pachamuthu Balakrishnan, Suneeta Saghayam,Timothy P. Flanigan, Charles Carpenter, Suniti Solomon, Kenneth H. Mayer. Reasons for modification of generic HAART regimens among patients in Southern India . [J Acquir Immune Defic Syndr](#). 2006 Jan 1;41(1):53-58.
- 73) Timothy Flanigan, Thomas Campbell, Joseph Harwell, **N.Kumarasamy**. The Extraordinary hope of Antiretroviral therapy in South Africa (Even for patients with Tuberculosis or Kaposi sarcoma!). The Journal of Infectious Diseases 2005;191:321-23
- 74) Tokugha Yepthomi, Snigdha Vallabhaneni, Sreekanth Chaguturu, Suniti Solomon, Timothy P. Flanigan, **N. Kumarasamy** .Neurologic Manifestations of Human Immunodeficiency Virus in Chennai, India (Submitted)
- 75) **N.Kumarasamy**, Timothy P. Flanigan, Snigdha Vallabhaneni, Anitha J. Cecelia, Priya Christybai, P. Balakrishnan, Tokugha Yepthomi, Suniti Solomon, Charles C.J. Carpenter, Kenneth H. Mayer. Randomized Control Trial of Structured Interrupted Generic Antiretroviral Therapy (SIT) versus Continuous Therapy (CT) in HIV-infected Individuals in Southern India. AIDS Care, April 2007; 19(4): 507_513
- 76) **N.Kumarasamy**, [Balakrishnan P](#), [Venkatesh KK](#), [Srikrishnan AK](#), [Cecelia AJ](#), [Thamburaj E](#), [Solomon S](#), [Mayer KH](#). Prevalence and Incidence of Sexually Transmitted Infections among South Indians at Increased Risk of HIV Infection. AIDS Patient Care STDS. 2008 Aug;22(8):677-82.

- 77) E. M. Shankar, **N. Kumarasamy**, P. Balakrishnan, S. Solomon, B. Devaleenol and U. A. Rao. Studies on the correlation of *Mycoplasma pneumoniae* infection with various immunological and haematological findings in HIV infected patients with underlying upper and lower respiratory infections in Chennai, South India. *The FEBS Journal* July 2005; 272(1)
- 78) E.M. Shankar, **N. Kumarasamy**, P. Balakrishnan & Usha Anand Rao. The effectiveness of Oil red-O and CBB R-250 in staining mycoplasma colonies and quantitation of CFU's with out the aid of microscope. *Ind J of Applied Microbiology* 2005; 5(1):167-68.
- 79) Shankar EM, **N. Kumarasamy**, Rajan R, Bella D, Balakrishnan P, Suniti Solomon and Usha A. Rao. *Aspergillus fumigatus*, *Pneumocystis jiroveci*, *Klebsiella pneumoniae* & *Mycoplasma fermentans* co-infection in a HIV infected patient with respiratory conditions from Southern India. *Indian J Med Res.* 2006 Feb;123(2):181-4.
- 80) **N. Kumarasamy**, Snigdha Vallabhaneni, Anitha J. Cecelia, Kenneth H. Mayer, Suniti Solomon, Charles C.J. Carpenter, Timothy P. Flanigan. Safe Discontinuation of *Pneumocystis Pneumonia* prophylaxis in South Indian HIV-infected Patients on HAART *J Acquir Immune Defic Syndr.* 2005 ; 40 (3): 377-378.
- 81) EM Shankar, **N.Kumarasamy**, P Balakrishnan, Suniti Solomon, Bella Devaleenol, Usha Rao. [Incidence of Mycoplasma Pneumoniae Infection in HIV Infected Patients With Underlying Upper and Lower Respiratory Complaints and Correlation With Various Immunological and Haematological Findings.](#) *Retrovirology* 2005 2:S97
- 82) Duraisamy P, Ganesh AK, Homan R, **N. Kumarasamy**, Castle C, Sripriya P, Mahendra V, and Solomon S. Costs and financial burden of care and support services to PLHA and households in south India. *AIDS Care.* Feb 2006 ; 18(2) : 121-127
- 83) EM Shankar,**N.Kumarasamy**,P.Balakrishnan, S.Solomon, Ravi Lejith, A.Venkatesan, Usha Anand Rao. Serosurveillance of acute *Mycoplasma pneumoniae* infection among HIV infected patients with pulmonary complaints in Chennai, Southern India. *Journal of Infection*, Volume 53, Issue 5, November 2006, Pages 325-330
- 84) Anitha Cecelia, Priya Christy Bai,S.Anand, Jayakumar, T.Gurunathan, Suniti Solomon, **N.Kumarasamy**. Usefulness of observational database to study the impact of antiretroviral therapy in resource constrained setting. *The Nat Med. J Ind.* Vol.19,No.1,2006: 14-17.
- 85) **N.Kumarasamy**. Can we reduce morbidity & mortality due to HIV and stop transmission in India?- Editorial. *Indian J Med Res* 122, Dec 2005,pp 461-463.

- 86) Solomon S, Cecelia A, James R, James L, Kouyoumdjian FG , **N. Kumarasamy**. Why are People Getting Tested? Self-Reported Reasons for Seeking Voluntary Counseling Testing at a Clinic in Chennai, India. *AIDS Behav.* 2006 Jul;10(4):415-20.
- 87) Safren SA, **N. Kumarasamy** , Hosseinipour M, Harwood MM, Hoffman I, McCauley M, Jumbe A, Nyirenda C, Mimiaga MJ, Solomon S, Celentano D, Mayer KH. Perceptions About the Acceptability of Assessments of HIV Medication Adherence in Lilongwe, Malawi and Chennai, India. *AIDS Behav.* 2006 Apr 8;
- 88) Tokugha Yephthomi, Robert Paul, Snigdha Vallabhaneni, **N. Kumarasamy**, David F. Tate, Suniti Solomon, and Timothy Flanigan, Neurocognitive consequences of HIV in southern India: A preliminary study of clade C virus. *Journal of the International Neuropsychological Society* 2006 May;12(3):424-30.
- 89) Shankar EM, **N. Kumarasamy** , Devaleenol B, Renuka Sreenivasan, Hayath Kownhar, Solomon S, Rajan R Rao UA. Pneumonia and pleural effusion due to *Cryptococcus laurentii* in a clinically proven case of AIDS. *Can Respir J.* 2006 Jul-Aug;13(5):275-8.
- 90) Shankar EM, **N. Kumarasamy** , P.Balakrishnan, Hayath Kownhar, Solomon S, Rao UA. Seroprevalence of *Mycoplasma pneumoniae* in HIV infected patients using Microscopic Agglutination Test. *Journal of Medical Microbiology* 2006 ;55:759-763
- 91) Sundaram Muthu, Sandeep, Anitha Cecelia, Srinivas, Sunil Solomon, P.Balakrishnan, Suniti Solomon, **N.Kumarasamy**. C-reactive protein in HIV-infected patients-could it be a marker of immunosuppression? *Clin Chim Acta.* 2006 Jun 6;
- 92) Rajesh Babu, Sudharshan S, **N.Kumarasamy** , Lily Therese, , Jyotirmay Biswas . Ocular Tuberculosis in Acquired Immunodeficiency Syndrome. *American J of Ophthalmology* 2006 .Sep;142(3):413-418.e2
- 93) P. Balakrishnan, S.Solomon ,J Mohanakrishnan, AJ Cecelia, **N. Kumarasamy**, KG Murugavel,V Bhavani, SS Solomon ,S M Crowe ,AK Ganesh,S P Thyagarajan,T Flanigan, K H Mayer. A Reliable and Inexpensive EasyCD4 Assay for Monitoring HIV-infected Individuals in Resource- Limited Settings. *J Acquir Immune Defic Syndr.* 2006 Jul 31;
- 94) Anitha Jebaraj Cecelia, P.Balakrishnan, Mohanakrishnan, Bhavani Venkatakrishnan, Suniti Solomon, N. Kumarasamy. Effective evaluation of novel low-cost CD4 monitoring assays. *J Immunol Methods.* 2006 Oct 20;316(1-2):158-62.
- 95) P.Balakrishnan, S.Saravanan, **N.Kumarasamy**, SS Solomon, S Solomon. HIV-1 drug resistance among untreated patients in India : Current status. *J Postgrad Med* 2006;52:190-3.

- 96) Shankar EM, **N.Kumarasamy** , Balakrishnan P, Saravanan S, Solomon S, Vengatesan A, Murugavel KG, Rao UA. Detection of pulmonary Mycoplasma pneumoniae infections in HIV-infected subjects using culture and serology. *Int J Infect Dis.* 2006 Aug 14;
- 97) Ramnath Subbaraman, SK Chaguturu, Kenneth Mayer, Timothy Flanigan, **N.Kumarasamy**. Adverse Effects of HAART in Developing countries- A review. *Clin Infect Dis.* 2007 Oct 15;45(8):1093-101
- 98) Suneeta Saghayam, **N.Kumarasamy** , Anitha J Cecelia, Suniti Solomon, Kenneth Mayer, Christine Wanke. Weight and Body Shape Changes in a Treatment Naïve Population after six months of Nevirapine - Based generic HAART in South India. *Clin Infect Dis.* 2007 Jan 15;44(2):295-300.
- 99) M. Sundaram, J. Mohanakrishnan, K. G. Murugavel, S. Pulimi, E. M. Shankar, S. Solomon, C. N. Srinivas, E. Piowar-Manning, S. Dawson, E. Livant, S. S. Solomon, **N. Kumarasamy**, P. Balakrishnan. Ethnic variation in certain hematological and biochemical reference intervals in the South Indian healthy adult population. *Eur J Intern Med.* 2008 Jan;19(1):46-50.
- 100) Kailapuri G.Murugavel , P. Balakrishnan, J. Mohanakrishnan, Sunil Suhas Solomon, M.Sundaram, **N.Kumarasamy**, EM. Shankar, Estelle Piowar-Manning, Edward Livant, Kenneth H Mayer, S.P.Thyagarajan, Suniti Solomon. Establishment of T-lymphocyte subset reference intervals in a healthy adult population in Chennai, India. *Indian J Med Res.* 2009 Jan;129(1):59-63.
- 101) **N.Kumarasamy**, Kartik K. Venkatesh, Anitha J Cecelia, Bella Devaleenal, Suneeta Saghayam , Tokugha Yephthomi, P.Balakrishnan, Timothy Flanigan, Suniti Solomon, Kenneth H. Mayer. Gender-based differences in HIV treatment and outcome among patients receiving generic HAART in Southern India. *Journal of Women's Health* 2008 Oct 27.
- 102) **N.Kumarasamy**, Kartik K. Venkatesh, Bella Devaleenal, Vidhya Palanivel, Anitha J. Cecelia, Sundaram Muthu, Tokugha Yephthomi, Kenneth H. Mayer , Timothy Flanigan. Safety of switching to NVP based HAART at elevated CD4 counts in a resource constrained setting. *J Acquir Immune Defic Syndr.* 2007 ; 45 (4): 598-600.
- 103) J Zhou, NI Paton,R Ditangco, Y-MA Chen, A Kamarulzaman, **N.Kumarasamy**, CKC Lee,PCK Li, TP Merati,P Phanuphak,S Pujari, A Vibhagool,F Zhang, J Chuah, KR Frost, DA Cooper and MG Law. Experience with the use of a first-line regimen of stavudine, lamivudine and nevirapine in patients in the TREAT Asia HIV Observational Database. *HIV Medicine* (2007) 8, 8–16

- 104) **N.Kumarasamy**, Kartik K. Venkatesh, Bella Devaleenal, Anitha J Cecelia, Tokugha Yephthomi, Suneeta Saghayam , Suniti Solomon, Kenneth H. Mayer. Opportunities and options for the use of Protease inhibitors in a resource poor setting: Experiences from Southern India. *J Acquir Immune Defic Syndr*. 2007 Sep 1;46(1):119-121
- 105) Umadevi KM, Ranganathan K, Pavithra S, Hemalatha R, Saraswathi TR, **N.Kumarasamy**, Solomon S, Greenspan JS. Oral lesions among persons with HIV disease with and without highly active antiretroviral therapy in southern India. *J Oral Pathol Med*. 2007 Mar;36(3):136-141.
- 106) Ramnath Subbaraman, Devaleenal B, Selvamuthu P, Yephthomi T, Solomon SS, Mayer KH, **N.Kumarasamy**. Factors Associated with Anemia in HIV-infected Individuals in Southern India. *Int J STD AIDS*. 2009 Jul;20(7):489-92.
- 107) Kenneth A. Freedberg ,**N. Kumarasamy**, Elena Losina, Anitha J. Cecelia, Callie A. Scott, Nomita Divi, Timothy P. Flanigan, Zhigang Lu, Milton C. Weinstein, Bingxia Wang, Aylur K. Ganesh, Melissa A. Bender, Kenneth H. Mayer, Rochelle P. Walensky. Clinical impact and cost-effectiveness of antiretroviral therapy in India: Starting criteria and second-line therapy. *AIDS* 2007;21: S117-S128.
- 108) Preeyaporn P Srasuebkul, Alexandra A Calmy, Jialun J Zhou, **N Kumarasamy**, Matthew M Law and Poh Lian PL Lim .Impact of drug classes and treatment availability on the rate of treatment change in an Asian cohort (TAHOD). *AIDS Research and Therapy* . 2007;4:18.
- 109) Shankar, E.M., **Kumarasamy N.**, Balakrishnan, P., Murugavel, K.G., Vignesh, R., Solomon, Rao, U.A. Epidemiological studies on pulmonary pathogens in HIV positive and negative subjects with and without community acquired pneumonia (CAP) with special reference to *Mycoplasma pneumoniae*. *Jpn. J. Infect. Dis*. 2007: 60,337-341 .
- 110) Shankar, E.M., Vignesh, R., Barton, R.C., Balakrishnan, Murugavel, K. G., Lloyd, C.A.C., Kownhar, H., Solomon, S., Rao, U.A., **Kumarasamy N**. Hydrothorax in association with *Scopulariopsis brumptii* in an AIDS patient in Chennai, India. *Trans R Soc Trop Med Hyg*. 2007 Oct 25.
- 111) Vignesh, R., Balakrishnan, P., Shankar, E.M., Murugavel, K.G., Hanas, S., Cecelia, A.J., Thyagarajan, S. P., Solomon, S., **Kumarasamy N**. High incidence of Isosporiasis diarrhoea in HIV positive persons in Southern India. 2007; *Am. J. Trop. Med. Hyg*. 77(5),2007,pp.823-824
- 112) [Ramachandran V, Shankar EM, Devaleenal B, Pachamuthu B, Thousen SM, Sekar R, Suniti S, Nagalingeswaran Kumarasamy](#). Atypically distributed cutaneous lesions of

- Norwegian scabies in an HIV-positive man in South India: a case report. *J Med Case Reports*. 2008 Mar 14;2:82.
- 113) Vignesh, R., Shankar, E.M., Balakrishnan, P., Mayer, K. H., Solomon, S., **N.Kumarasamy**. High rate of acquired resistance in tuberculosis among HIV infected subjects of Chennai. *J. Infect.*2007 .Oct 26th.
- 114) Vignesh R, Balakrishnan P, Shankar EM, Gangatharan Murugavel K, Hanas S, Cecelia AJ, Solomon S, **N.Kumarasamy** . Value of single acid-fast bacilli sputum smears in the diagnosis of tuberculosis in HIV-positive subjects. *J Med Microbiol*. 2007 Dec;56(Pt 12):1709-10.
- 115) Vignesh, R., Shankar, E.M., Balakrishnan, P., Solomon, S., **Kumarasamy N**. *Isospora belli*, *Strongyloides stercoralis* and hookworm coinfection in a HIV positive individual with normal CD4 lymphocyte count. *Indian J Med Res*. 2008 Apr;127(4):403-5.
- 116) Saravanan S, Velu V, **N.Kumarasamy**, Nandakumar S, Murugavel KG, Balakrishnan P, Suniti S, Thyagarajan SP. Coinfection of hepatitis B and hepatitis C virus in HIV infected patients in South India. *World J Gastroenterol* 2007; 13(37): 5015-5020
- 117) E M Shankar, R Vignesh, KG Murugavel, P Balakrishnan, Charmaine AC Lloyd, R Sekar, Suniti Solomon, **N Kumarasamy**. Immune reconstitution inflammatory syndrome in association with HIV/AIDS and tuberculosis: Views over hidden possibilities. *AIDS Research and Therapy* 2007 Nov 30;4(1):29.
- 118) Iqbal HS, Balakrishnan P, Cecelia AJ, Solomon S, **N. Kumarasamy** , Madhavan V, Murugavel KG, Ganesh AK, Solomon SS, Mayer KH, Crowe SM. Use of an HIV-1 reverse-transcriptase enzyme-activity assay to measure HIV-1 viral load as a potential alternative to nucleic acid-based assay for monitoring antiretroviral therapy in resource-limited settings. *J Med Microbiol*. 2007 Dec;56(Pt 12):1611-4.
- 119) **N. Kumarasamy**, Kartik K. Venkatesh, Kenneth H. Mayer, Kenneth Freedberg. Financial burden of health services for people with HIV/AIDS in India. *Indian Journal of Medical Research* 126, Dec 2007, pp509-517.
- 120) [Sri Krishnan AK, Hendriksen E, Vallabhaneni S, Johnson SL, Raminani S, N. Kumarasamy, Hobsen J, Solomon S, Mayer KH, Safren SA](#). Sexual behaviors of individuals with HIV living in South India: a qualitative study. *AIDS Educ Prev*. 2007 Aug;19(4):334-45.
- 121) Kartik K Venkatesh, J. Biswas, **N.Kumarasamy**. Impact of Highly active antiretroviral therapy (HAART) on Ophthalmic manifestations in HIV/AIDS. *Indian J Ophthalmology* 2008.

- 122) Bella Devaleenal, N.Ahilasamy, Suniti Solomon, **N. Kumarasamy**, Ramsay Hunt syndrome in a person with HIV disease. Indian Journal of ENT 2008.
- 123) N. Kumarasamy, **Kartik K. Venkatesh, Bella Devaleenol, S.Poongulali, Anitha J. Cecelia, Tokugha Yepthomi, Suneeta Saghayam, A. Pradeep, P. Balakrishnan, Suniti Solomon, Kenneth H. Mayer, Constance Benson. AIDS-defining Illnesses (ADIs) after initiating generic HAART in Southern India: the case for earlier identification and intervention.**
- 124) Kartik K. Venkatesh, Lakshmi Prasad, Kenneth H. Mayer, **N. Kumarasamy**. HIV transmission transcends three generations: Can we prevent secondary transmission in India? Int J STD AIDS. 2008 Jun;19(6):418-20.
- 125) **N. Kumarasamy**, Kartik K. Venkatesh, Bella Devaleenol, S.Poongulali, N.Ahilasamy. Regression of Kaposi Sarcoma lesions following Highly Active Antiretroviral Therapy in an HIV-infected patient. International Journal of STD & AIDS. 2008;19:786-788.
- 126) **N.Kumarasamy**, Kartik K. Venkatesh, Bella Devaleenol, Deepak Manohar, S. Poongulali, Tokugha Yepthomi, Pradeep Ambrose, Suniti Solomon, Kenneth H. Mayer. Safe substitution to AZT among HIV-infected patients initiated on d4T containing HAART from a resource-limited setting. Int J Infect Dis. 2009 Mar 26.
- 127) Shankar EM, Vignesh R, Velu V, Murugavel KG, Sekar R, Balakrishnan P, Lloyd CA, Saravanan S, Solomon S, **N.Kumarasamy** . Does CD4+CD25+FoxP3+ cell (Treg) and IL-10 profile determine susceptibility to immune reconstitution inflammatory syndrome (IRIS) in HIV disease? J Inflamm (Lond). 2008 Feb 18;5(1):2
- 128) Uma Shanmugasundaram, Kailapuri G. Murugavel, Pachamuthu Balakrishnan, Esaki Muthu Shankar, Suniti Solomon, **N. Kumarasamy**. Laboratory characteristics of HIV – 1 clade C infected long term non-progressors at a tertiary HIV care centre in South India. J Med Microbiol. 2008 Jul;57(Pt 7):913-5.
- 129) M. Sundaram, S. Saghayam, A. J. Cecelia, Kartik K. Venkatesh, P. Balakrishnan, E. M. Shankar, B. Priya, K. G. Murugavel, S. Solomon, **N. Kumarasamy**. Changes in antioxidant profile among HIV- infected individuals on generic HAART in Southern India. Int J Infectious Diseases 2008. Jul 11.
- 130) Esaki Muthu Shankar, Sunil Suhas Solomon, Pachamuthu Balakrishnan, Ramachandran Vignesh, Kailapuri G. Murugavel, **N.Kumarasamy**, Suniti Solomon .GB virus infection: a silent anti-HIV panacea within? Transactions of the Royal Society of Tropical Medicine and Hygiene .2008 May 28.
- 131) Ramachandran Vignesh, Ramalingam Sekar, Esaki Muthu Shankar, **N.Kumarasamy**, Kailapuri G. Murugavel, Paulas Irene, Suniti Solomon and Pachamuthu Balakrishnan.

- Wet mounting using iodine–glycerol provides a semi-permanent preparation for microscopic observation of faecal parasites. *Journal of Medical Microbiology*. 2008 57: 679-680.
- 132) Muthu Sundaram, CN Srinivas, Esaki Muthu Shankar, Manohar Deepak, Kailapuri G Murugavel, Pachamuthu Balakrishnan, Suniti Solomon, **N. Kumarasamy**. Co-factors for abnormal lactate levels among persons with HIV disease at a tertiary HIV care setting in South India. *Food Chem Toxicol*. 2008 Aug;46(8):2823-5.
- 133) S Saravanan, Vijayakumar Velu, **N.Kumarasamy**, E M Shankar, Subhadra Nandakumar, KG Murugavel, P Balakrishnan, S Solomon, S P Thyagarajan. Seroprevalence of hepatitis delta virus infection among subjects with underlying hepatic diseases in Chennai, southern India. *Transactions of the Royal Society of Tropical Medicine and Hygiene* .2008: 902 1—4.
- 134) Kawsar R. Talaat, **N Kumarasamy**, Soumya Swaminathan, Ramya Gopinath and Thomas B. Nutman .Filarial/HIV coinfection in urban Southern India. *Am J Trop Med Hyg*. 2008 Oct;79(4):558-60.
- 135) [Janakiraman H](#), [Abraham G](#), [Matthew M](#), [Kuruville S](#), [Panikar V](#), [Solomon S](#); **N.Kumarasamy**, [Seshan SV](#), [Lesley N](#). Correlation of CD4 Counts with Renal Disease in HIV Positive Patients. [Saudi J Kidney Dis Transpl](#). 2008 Jul-Aug;19(4):603-7.
- 136) Kartik Venkatesh, **N.Kumarasamy**. India drops the number of HIV infected individuals by half: Impact on the global epidemiology of HIV/AIDS. *Future HIV Therapy* (2008), 2 (5), 395-398.
- 137) **N Kumarasamy**, Kartik K Venkatesh, Bella Devaleenol, S Poongulali, SNMothi, Suniti Solomon. Safety, tolerability, and effectiveness of generic HAART in HIV-infected children in South India. *Journal of Tropical Pediatrics*. 2008 :Oct 1.
- 138) **N. Kumarasamy**, Kartik K. Venkatesh, Bella Devaleenol, S. Poongulali, Tokugha Yephthomi, A. Pradeep, Suneeta Saghayam, Timothy Flanigan, Kenneth H. Mayer, Suniti Solomon. Factors associated with mortality among HIV-infected patients in the era of highly active antiretroviral therapy in Southern India. *International Journal of Infectious Diseases* 2009.
- 139) [Vignesh R](#), [Shankar EM](#), [Murugavel KG](#), **N.Kumarasamy** , [Sekar R](#), [Irene P](#), [Solomon S](#), [Balakrishnan P](#). Urinary Infections due to Multi-Drug-Resistant Escherichia coli among Persons with HIV Disease at a Tertiary AIDS Care Centre in South India. *Nephron Clin Pract*. 2008 Aug 25;110(1):c55-c57.

- 140) **N. Kumarasamy**, Kartik K Venkatesh, AK Srikrishnan, Lakshmi Prasad, P Balakrishnan, Esther Thamburaj, Jabin Sharma, Suniti Solomon, Kenneth Mayer. Risk factors for HIV transmission among heterosexual discordant couples in South India .HIV Medicine 2009. Sep 24. .
- 141) **N.Kumarasamy**, Kartik Venkatesh, AK Srikrishnan, Lakshmi Prasad, P.Balakrishnan, KG Murugavel, Esther Thamburaj, Suniti Solomon,Kenneth Mayer. Couples at risk for HIV infection in Southern India: Characteristics of HIV infected patients in concordant and discordant heterosexual relationships. Int J STD AIDS. 2010 Feb;21(2):96-100.
- 142) Shanmugam S, Velu V, Nandakumar S, Madhavan V, Shanmugasundaram U, Shankar EM, Murugavel KG, Balakrishnan P, **N.Kumarasamy** , Solomon S, Thyagarajan SP.Low Frequency of Precore Mutants in Anti-Hepatitis B e Antigen Positive Subjects with Chronic Hepatitis B Virus Infection in Chennai, Southern India. J Microbiol Biotechnol. 2008 Oct;18(10):1722-8.
- 143) Suniti Solomon, K.K. Venkatesh, L. Brown, P. Verma, A.J. Cecelia, C. Daly, V.S. Mahendra, N. Cheng, **N. Kumarasamy**, K.H. Mayer. Gender-Related Differences in Quality of Life Domains of Persons Living with HIV/AIDS in South India in the Era Prior to Greater Access to Antiretroviral Therapy. AIDS Patient Care STDS. 2008 Dec;22(12):999-1005
- 144) **N. Kumarasamy**, Vidya Madhavan, Kartik K Venkatesh, S. Saravanan, Rami Kantor, P. Balakrishnan, Bella Devaleenol S. Poongulali, Tokugha Yepthomi,Suniti Solomon, Kenneth H Mayer, Constance Benson, Robert Schooley. High Frequency of Clinically Significant Mutations following first-line generic HAART failure: Implications for second line options in resource-limited settings.Clinical Infectious Diseases.2009.Jul 15;49(2):306-9.
- 145) Saravanan S, Velu V, **N.Kumarasamy** , Shankar EM, Nandakumar S, Murugavel KG, Balakrishnan P, Solomon SS, Solomon S, Thyagarajan SP. The prevalence of hepatitis B virus and hepatitis C virus infection among patients with chronic liver disease in South India. Int J Infect Dis. 2008 Sep;12(5):513-8.
- 146) M.Sundaram, EM Shanker, P.Balakrishnan, S. Solomon, **N.Kumarasamy**. Co Factors for Low Serum Albumin Levels Among HIV-Infected Individuals in Southern India . Journal of the International Association of Physicians in AIDS Care (Chic Ill). 2009 Jan 27.
- 147) Srasuebkul P, Lim PL, Lee MP, **N.Kumarasamy**, Zhou J, Sirisanthana T, Li PC, Kamarulzaman A, Oka S, Phanuphak P, Vonthanak S, Merati TP, Chen YM, Sungkanuparph S, Tau G, Zhang F, Lee CK, Ditangco R, Pujari S, Choi JY, Smith J, Law MG .Short-Term Clinical Disease Progression in HIV-Infected Patients Receiving

- Combination Antiretroviral Therapy: Results from the TREAT Asia HIV Observational Database.. Clin Infect Dis. 2009 Feb 18.
- 148) Vignesh R, Shankar EM, **N.Kumarasamy** , Irene P, Murugavel KG, Solomon S, Balakrishnan P, Mayer KH. Predominance of methicillin-resistant Staphylococcus aureus among HIV positive subjects with pyrexia of unknown origin in Chennai, Southern India. J Infect. 2009 Apr;58(4):313-4.
- 149) Zhou J, Elliott J, Li PC, Lim PL, Kiertiburanakul S, **N.Kumarasamy** , Merati TP, Pujari S, Chen YM, Phanuphak P, Vonthanak S, Sirisanthana T, Sungkanuparph S, Lee CK, Kamarulzaman A, Oka S, Zhang F, Tau G, Ditangco R. Risk and prognostic significance of tuberculosis in patients from The TREAT Asia HIV Observational Database. BMC Infect Dis. 2009 Apr 21;9(1):46.
- 150) Sundaram M, Srinivas CN, Shankar EM, Balakrishnan P, Solomon S, **N.Kumarasamy** . Alterations in acute-phase proteins among HIV-1 infected persons receiving generic HAART in southern India. J Infect. 2009 Apr 19. PMID: 19443037.
- 151) Olivia Keiser; Hannock Tweya; Andrew Boule; Paula Braitstein; Mauro Schechter; Martin Brinkhof; François Dabis; Suely Tuboi; Eduardo Sprinz; Mar Pujades; Alexandra Calmy; **N. Kumarasamy**; Denis Nash; Andreas Jahn; Andrew P McPhail; Ruedi Lüthy; Robin Wood; Matthias Egger. Switching to second-line ART in resource-limited settings: Comparison of programmes with and without viral load monitoring .AIDS 2009 (In press)
- 152) A.Spaar, C. Graber.F. Dabis, A Coutoudis, I. Bachmann, J. McIntyre, M. Schechter, H.W. Prozeskzy, S. Tuboi, D. Dickinson, **N. Kumarasamy**, M. Pujades-Rodriquez, E. Sprinz, H.J. Schilthuis, P. Cahn, N. Low, M. Egger. Prioritising prevention strategies for patients in Antiretroviral Treatment Programs in Resource-Limited Settings (Submitted)
- 153) S. Saravanan, M. Vidya, P. Balakrishnan, **N. Kumarasamy**, Sunil S. Solomon, S. Solomon, Rami Kantor, David Katzenstein, Bharat Ramratnam, Kenneth H. Mayer. Evaluation of two human immunodeficiency virus-1 genotyping systems: ViroSeq™ 2.0 and an in-house method. Journal of Virological Methods 159 (2009) 211–216.
- 154) Melissa A. Bender, **N.Kumarasamy**, Kenneth H. Mayer, Bingxia Wang, Rochelle Walensky, Timothy Flanigan, Bruce Schackman, Callie A. Scott, Zhigang Lu, Kenneth A. Freedberg, for the CEPAC-International investigators. Potential Cost-Effectiveness of Tenofovir as First-Line Antiretroviral Therapy in India. Clinical Infectious Diseases 2010. Feb 1;50(3):416-25

- 155) Saravanan S, Velu V, Nandakumar S, Madhavan V, Shanmugasundaram U, Murugavel KG, Balakrishnan P, **N.Kumarasamy**, Solomon S, Thyagarajan SP. Hepatitis B virus and hepatitis C virus dual infection among patients with chronic liver disease. *J Microbiol Immunol Infect.* 2009 Apr;42(2):122-8.
- 156) Zhou J, Li P, **N.Kumarasamy**, Boyd M, Chen Y, Sirisanthana T, Sungkanuparph S, Oka S, Tau G, Phanuphak P, Saphonn V, Zhang F, Omar S, Lee C, Ditangco R, Merati T, Lim P, Choi J, Law M, Pujari S; on behalf of the TREAT Asia HIV Observational Database. Deferred modification of antiretroviral regimen following documented treatment failure in Asia: results from the TREAT Asia HIV Observational Database (TAHOD). *HIV Med.* 2010Jan;11(1):31-9.
- 157) Walensky RP, Wolf LL, Wood R, Fofana MO, Freedberg KA, Martinson NA, Paltiel AD, Anglaret X, Weinstein MC, Losina E; CEPAC (Cost-Effectiveness of Preventing AIDS Complications)-International Investigators. [Messou E](#), [Seyler C](#), [Touré S](#), [Yazdanpanah Y](#), **N.Kumarasamy**, [Ganesh J](#), [Ganesh AK](#), [Gray G](#), [McIntyre J](#), [Mohapi L](#), [Cotich K](#), [Goldie S](#), [Horsburgh CR](#), [Kimmel A](#), [Lipsitch M](#), [McCormick A](#), [Rydzak C](#), [Seage GR 3rd](#), [Zhang H](#), [Hsu HE](#), [Bassett IV](#), [Bender MA](#), [Chung S](#), [Ciaranello A](#), [Linás BP](#), [Lu Z](#), [Morris B](#), [Saxena A](#), [Sloan C](#), [Uhler L](#), [Wang B](#), [Chaisson R](#), [De Gruttola V](#), [Eron J](#), [Gangakhedkar RR](#), [Kaplan J](#), [Karim S](#), [Yoman TN](#), [Owens D](#), [Wong J](#). When to start antiretroviral therapy in resource-limited settings. *Ann Intern Med.* 2009 Aug 4;151(3):157-66. Epub 2009 Jul 20.
- 158)** Madhavan Vidya, Shanmugam Saravanan, Shanmugasundaram Uma, **N .Kumarasamy**, Solomon S Suni, Rami Kantor, David Katzenstein, Bharat Ramratnam, Kenneth H Mayer ,Solomon Suniti , Pachamuthu Balakrishnan. Genotypic HIV type-1 drug resistance among patients with immunological failure to first-line antiretroviral therapy in south India. *Antiviral Therapy* 2009;14(7):1005-9.
- 159) Sanjay Pujari, Preeyaporn Srasuebkul, Somnuek Sungkanuparph, Poh Lian Lim, **N.Kumarasamy**, John Chuah, Ritesh N Kumar, Yi-Ming A. Chen, Shinichi Oka, Jun Yong Choi, Man-po Lee, Praphan Phanuphak, Adeeba Kamarulzaman, Christopher Lee, Zhang Fujie, Rosanna Ditangco, Vonthanak Saphonn, Thira Sirisanthana, Tuti Parwati Merati, Jeff Smith and Matthew G. Law. Patient Characteristics and Treatment Outcome Associated with Protease Inhibitor (PI) use in the Asia-Pacific Region. *J Antivir Antiretrovir.* 2009 Nov 1;11(1):28-35.
- 160) Shanmugasundaram U, Solomon S, Shanmugam S, Murugavel KG, **N. Kumarasamy**, Solomon SS, Mayer KH, Pachamuthu B. HIV-1 variation in plasma reverse transcriptase

- and genital secretion of antiretroviral-naive females. *J Int Assoc Physicians AIDS Care (Chic Ill)*. 2009 Nov-Dec;8(6):375-8.
- 161) Paranthaman K, **N.Kumarasamy** , Bella D, Webster P. Factors influencing adherence to anti-retroviral treatment in children with human immunodeficiency virus in South India--a qualitative study.*AIDS Care*. 2009 Aug;21(8):1025-31.
- 162) **N. Kumarasamy**, Mahua Ganguly. Need for newer antiretroviral drugs in India.*Indian J Med Res* 130, December 2009, pp 669-670.
- 163) Azar Kariminia, Kulkanya Chokephaibulkit, Joselyn Pang, Pagakrong Lumbiganon, Rawiwan Hansudewechakul, Janaki Amin, **N.Kumarasamy**, Thanyawee Puthanakit, Nia Kurniati, Nik Khairulddin Nik Yusoff, Vonthanak Saphonn,Siew Moy Fong, Kamarul Razali, Revathy Nallusamy, Annette H Sohn and Virat Sirisanthana. Cohort Profile: The TREAT Asia Pediatric HIV Observational Database. *Int. J. Epidemiol*. 2010.
- 164) De Costa A, Shet A, **N.Kumarasamy** , Ashorn P, Eriksson B, Bogg L, Diwan VK, Team TH.Design of a randomized trial to evaluate the influence of mobile phone reminders on adherence to first line antiretroviral treatment in South India - the HIVIND study protocol. *BMC Med Res Methodol*. 2010 Mar 26;10(1):25.
- 165) Oyomopito R, Lee MP, Phanuphak P, Lim PL, Ditangco R, Zhou J, Sirisanthana T, Chen YM, Pujari S, **N.Kumarasamy** , Sungkanuparph S, Lee CK, Kamarulzaman A, Oka S, Zhang FJ, Mean CV, Merati T, Tau G, Smith J, Li PC; on behalf of The TREAT Asia HIV Observational Database. Measures of site resourcing predict virologic suppression, immunologic response and HIV disease progression following highly active antiretroviral therapy (HAART) in the TREAT Asia HIV Observational Database (TAHOD). *HIV Med*. 2010 Mar 21.
- 166) K.Ranganathan, E. Geethalakshmi, Umadevi Krishna Mohan Rao, KM.vidya, **N.Kumarasamy** ,Suniti Solomon Orofacial and systemic manifestations in 212 paediatric HIV patients from Chennai, South India. *International Journal of Paediatric Dentistry* 2010; 20: 276–282.
- 167) Kartik K Venkatesh, AK Srikrishnan, Steven A Safren, Elizabeth W Triche, E Thamburaj, Lakshmi Prasad, Mark N Lurie, M Suresh Kumar, **N .Kumarasamy**, Suniti Solomon, Kenneth H Mayer. Sexual risk behaviors among HIV-infected South Indian couples in the HAART era: implications for reproductive health and HIV care delivery. *AIDS Care* 2010.
- 168) Venkatesh KK, Srikrishnan AK, Mayer KH, **N.Kumarasamy** , Raminani S, Thamburaj E, Prasad L, Triche EW, Solomon S, Safren SA. Predictors of Nonadherence to Highly Active Antiretroviral Therapy Among HIV-Infected South Indians in Clinical Care:

Implications for Developing Adherence Interventions in Resource-Limited Settings. AIDS Patient Care STDS. 2010 Nov 22.

- 169) Rodríguez DC, Krishnan AK, **N.Kumarasamy** , Krishnan G, Solomon D, Johnson S, Vasudevan CK, Solomon R, Ekstrand ML. Two sides of the same story: alcohol use and HIV risk taking in South India. AIDS Behav. 2010 Aug;14 Suppl 1:S136-46.
- 170) Shanmugasundaram U, Solomon S, Murugavel KG, **Nagalingeswaran Kumarasamy**, Solomon SS, Mayer KH, Pachamuthu B. Short communication: Nucleotide variation and positively selected sites in HIV type 1 reverse transcriptase among heterosexual transmission pairs. AIDS Res Hum Retroviruses. 2010 Aug;26(8):895-9.
- 171) Hansudewechakul R, Sirisanthana V, Kurniati N, Puthanakit T, Lumbiganon P, Saphonn V, Nik Yusoff NK, **N.Kumarasamy** , Fong SM, Nallusamy R, Srasuebku P, Law M, Sohn AH, Chokephaibulkit K; for the TREAT Asia Pediatric HIV Observational Database. Antiretroviral Therapy Outcomes of HIV-infected children in the TREAT Asia Pediatric HIV Observational Database. J Acquir Immune Defic Syndr. 2010 Sep 14.
- 172) Shanmugasundaram U, Solomon S, Madhavan V, Kailapuri MG, **Nagalingeswaran Kumarasamy**, Solomon SS, Mayer KH, Pachamuthu B. Short Communication: Analysis of Selection Pressure and Mutational Pattern of HIV Type 1 Reverse Transcriptase Region Among Treated and Nontreated Patients. AIDS Res Hum Retroviruses. 2010 Sep 19.
- 173) Uhler LM, **N.Kumarasamy** , Mayer KH, Saxena A, Losina E, Muniyandi M, Stoler AW, Lu Z, Walensky RP, Flanigan TP, Bender MA, Freedberg KA, Swaminathan S; CEPAC International investigators. Cost-effectiveness of HIV testing referral strategies among tuberculosis patients in India. PLoS One. 2010 Sep 16;5(9).
- 174) [Firnhaber C, Smeaton L, Saukila N, Flanigan T, Gangakhedkar R, Kumwenda J, La Rosa A, N. Kumarasamy , De Gruttola V, Hakim JG, Campbell TB. Comparisons of anemia, thrombocytopenia, and neutropenia at initiation of HIV antiretroviral therapy in Africa, Asia, and the Americas. Int J Infect Dis. 2010 Oct 18.](#)
- 175) Hamers RL, Oyomopito R, Kityo C, Phanuphak P, Siwale M, Sungkanuparph S, Conradie F, **N.Kumarasamy** , Botes ME, Sirisanthana T, Abdallah S, Li PC, Ngorima N, Kantipong P, Osibogun A, Lee CK, Stevens WS, Kamarulzaman A, Derdelinckx I, Chen YM, Schuurman R, Vugt MV, Rinke de Wit TF; on behalf of the PharmAccess African (PASER) and TREAT Asia (TASER) Studies to Evaluate Resistance. Cohort Profile: The PharmAccess African (PASER-M) and the TREAT Asia (TASER-M) Monitoring Studies to Evaluate Resistance--HIV drug

- resistance in sub-Saharan Africa and the Asia-Pacific. *Int J Epidemiol.* 2010 Nov 10.
- 176) Petoumenos K, Hui E, **N.Kumarasamy**, Kerr SJ, Choi JY, Chen YM, Merati T, Zhang F, Lim PL, Sungkanuparph S, Pujari S, Ponnampalavanar S, Ditangco R, Lee CK, Grulich A, Law MG, Asia Hiv Observational Database T. Cancers in the TREAT Asia HIV Observational Database (TAHOD): a retrospective analysis of risk factors. *J Int AIDS Soc.* 2010 Dec 10;13(1):51.
- 177) [Zhou J](#), [Sirisanthana T](#), [Kiertiburanakul S](#), [Chen YM](#), [Han N](#), [Lim PL](#), [N.Kumarasamy](#), [Choi JY](#), [Merati TP](#), [Yunihastuti E](#), [Oka S](#), [Kamarulzaman A](#), [Phanupak P](#), [Lee CK](#), [Li PC](#), [Pujari S](#), [Saphonn V](#), [Law MG](#). **Trends in CD4 counts in HIV-infected patients with HIV viral load monitoring while on combination antiretroviral treatment: results from The TREAT Asia HIV Observational Database.** *BMC Infect Dis.* 2010 Dec 23;10(1):361.
- 178) L. Fenner, M. Forster, A. Boulle, S. Phiri, P. Braitstein, C. Lewden, M. Schechter, **N. Kumarasamy**, M. Pascoe, E. Sprinz, D. R. Bangsberg, P. Salif Sow, D. Dickinson, M. Fox, J. McIntyre, M. Khongphatthanayothin, F. Dabis, M. W. G. Brinkhof, R. Wood, M. Egger. Tuberculosis in HIV programmes in lower income countries: practices and risk factors. *Int J Tuberc Lung Dis* 15(5):1–8. 2011.
- 179) Lumbiganon P, Kariminia A, Aurpibul L, Hansudewechakul R, Puthanakit T, Kurniati N, **N.Kumarasamy**, Chokeyhaibulkit K, Nik Yusoff NK, Vonthanak S, Moy FS, Razali KA, Nallusamy R, Sohn AH; TREAT Asia Pediatric HIV Observational Database (TAPHOD). Survival of HIV-infected children: a cohort study from the Asia-Pacific region. *J Acquir Immune Defic Syndr.* 2011 Apr;56(4):365-71.
- 180) **N.Kumarasamy**, Venkatesh KK, Devaleenal B, Poongulali S, Yephthomi T, Solomon S, Flanigan TP, Mayer KH. Safety, Tolerability, and Efficacy of Second-Line Generic Protease Inhibitor Containing HAART after First-Line Failure among South Indian HIV-Infected Patients. *J Int Assoc Physicians AIDS Care (Chic).* 2011 Mar-Apr;10(2):71-5.
- 181) Venkatesh KK, Srikrishnan AK, Safren SA, Triche EW, Thamburaj E, Prasad L, Lurie MN, Kumar MS, **N.Kumarasamy**, Solomon S, Mayer KH. Sexual risk behaviors among HIV-infected South Indian couples in the HAART era: implications for reproductive health and HIV care delivery. *AIDS Care.* 2011 Jun;23(6):722-33.
- 182) Safren SA, Hendriksen ES, Smeaton L, Celentano DD, Hosseinipour MC, Barnett R, Guanira J, Flanigan T, **N.Kumarasamy**, Klingman K, Campbell T. Quality of Life Among Individuals with HIV Starting Antiretroviral Therapy in Diverse Resource-Limited Areas of the World. *AIDS Behav.* 2011 Apr 16.

- 183) Ekstrand ML, Shet A, Chandy S, Singh G, Shamsundar R, Madhavan V, Saravanan S, Heylen E, **N.Kumarasamy** .Suboptimal adherence associated with virological failure and resistance mutations to first-line highly active antiretroviral therapy (HAART) in Bangalore, India. *Int Health*. 2011 Mar 1;3(1):27-34.
- 184) [Kalpana R](#), [Muttan S](#), **N.Kumarasamy**. Virus infection on brain white matter: statistical analysis of DT MRI scans. *Int J Bioinform Res Appl*. 2011;7(3):273-86.
- 185) Havlir DV, Kendall MA, Ive P, Kumwenda J, Swindells S, Qasba SS, Luetkemeyer AF, Hogg E, Rooney JF, Wu X, Hosseinipour MC, Lalloo U, Veloso VG, Some FF, **N.Kumarasamy**, Padayatchi N, Santos BR, Reid S, Hakim J, Mohapi L, Mugenyi P, Sanchez J, Lama JR, Pape JW, Sanchez A, Asmelash A, Moko E, Sawe F, Andersen J, Sanne I; AIDS Clinical Trials Group Study A5221. Timing of antiretroviral therapy for HIV-1 infection and tuberculosis. *N Engl J Med*. 2011 Oct 20;365(16):1482-91.
- 186) Eshleman SH, Hudelson SE, Redd AD, Wang L, Debes R, Chen YQ, Martens CA, Ricklefs SM, Selig EJ, Porcella SF, Munshaw S, Ray SC, Piwowar-Manning E, McCauley M, Hosseinipour MC, Kumwenda J, Hakim JG, Chariyalertsak S, de Bruyn G, Grinsztejn B, **N.Kumarasamy** , Makhema J, Mayer KH, Pilotto J, Santos BR, Quinn TC, Cohen MS, Hughes JP. Analysis of Genetic Linkage of HIV From Couples Enrolled in the HIV Prevention Trials Network 052 Trial. *J Infect Dis*. 2011 Dec 15;204(12):1918-26.
- 187) Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, **N.Kumarasamy** , Hakim JG, Kumwenda J, Grinsztejn B, Pilotto JH, Godbole SV, Mehendale S, Chariyalertsak S, Santos BR, Mayer KH, Hoffman IF, Eshleman SH, Piwowar-Manning E, Wang L, Makhema J, Mills LA, de Bruyn G, Sanne I, Eron J, Gallant J, Havlir D, Swindells S, Ribaud H, Elharrar V, Burns D, Taha TE, Nielsen-Saines K, Celentano D, Essex M, Fleming TR; HPTN 052 Study Team. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011 Aug 11;365(6):493-505. Epub 2011 Jul 18.
- 188) Grinsztejn B, Smeaton L, Barnett R, Klingman K, Hakim J, Flanigan T, **N.Kumarasamy** , Campbell T, Currier J; the PEARLS study team of the ACTG. [Sex-associated differences in pre-antiretroviral therapy plasma HIV-1 RNA in diverse areas of the world vary by CD4\(+\) T-cell count](#). *Antivir Ther*. 2011;16(7):1057-1062.
- 189) Hendriksen ES, Krishnan AK, Vallabhaneni S, Johnson S, Raminani S, **Kumarasamy N**, Solomon S, Mayer KK, Safren SS. Primary prevention lessons learned from those with HIV in Chennai, India. *Sex Health*. 2011 Jun;8(2):199-206.
- 190) Saravanan S, Madhavan V, Murugavel KG, Balakrishnan P, Solomon SS, Umapathy S, Kantor R, **Kumarasamy N**, Yepthomi T, Smith DM, Mayer KH, Solomon S. The association between HIV-1 subtype C antiretroviral resistance and HLA prevalence in southern India. *J Acquir Immune Defic Syndr*. 2011 May;57(1):e17-9.

- 191) Robertson K, Kumwenda J, Supparatpinyo K, Jiang JH, Evans S, Campbell TB, Price RW, Murphy R, Hall C, Marra CM, Marcus C, Berzins B, Masih R, Santos B, Silva MT, **Kumarasamy N**, Walawander A, Nair A, Tripathy S, Kanyama C, Hosseinipour M, Montano S, La Rosa A, Amod F, Sanne I, Firnhaber C, Hakim J, Brouwers P; AIDS Clinical Trials Group. A multinational study of neurological performance in antiretroviral therapy-naïve HIV-1-infected persons in diverse resource-constrained settings. *J Neurovirol.* 2011 Oct;17(5):438-47. Epub 2011
- 192) Kumar SA, Kumar N, **Kumarasamy N**. Genital lesions: An indication for changing ART regimen. *Indian J Sex Transm Dis.* 2011 Jan;32(1):37-9.
- 193) Saravanan S, Madhavan V, Balakrishnan P, Solomon SS, **Kumarasamy N**, Mayer KH, Waldrop G, Solomon S, Smith DM. HIV-1 reverse transcriptase nucleotide substitutions in subtype C-infected, drug-naïve, and treatment-experienced patients in South India. *J Acquir Immune Defic Syndr.* 2011 Nov 1;58(3):e94-5.
- 194) [Chi BH](#), [Yiannoutsos CT](#), [Westfall AO](#), [Newman JE](#), [Zhou J](#), [Cesar C](#), [Brinkhof MW](#), [Mwango A](#), [Balestre E](#), [Carriquiry G](#), [Sirisanthana T](#), [Mukumbi H](#), [Martin JN](#), [Grimrud A](#), [Bacon M](#), [Thiebaut R](#); [International Epidemiologic Databases to Evaluate AIDS Collaboration](#). Collaborators (103) **Kumarasamy N**, [Sagayam S](#), [Ezhilarasi C](#), [Lee CK](#), [Sim BH](#), [David R](#), [Chen YM](#), [Wong WW](#), [Kuo LH](#), [Phanuphak P](#), [Ruxrungtham K](#), [Khongphattayanayothin M](#), [Kiartiburanakul S](#), [Sungkanuparph S](#), [Sanmeema N](#), [Chaiwarith R](#), [Kotarathitum W](#), [Sohn AH](#), [Messerschmidt L](#), [Petersen B](#), [Cooper DA](#), [Law MG](#), [Zhou J](#), [Jiamsakul A](#), [Caro-Vega YN](#), [Crabtree-Ramirez B](#), [Sierra-Madero JG](#), [Eholie SP](#), [Koule S](#), [Zannou MD](#), [Charurat M](#), [Salif Sow P](#), [Ekouevi DK](#), [Dabis F](#), [Williams C](#), [Bacon M](#), [Huebner R](#). Universal definition of loss to follow-up in HIV treatment programs: a statistical analysis of 111 facilities in Africa, Asia, and Latin America. *PLoS Med.* 2011 Oct;8(10):e1001111. Epub 2011 Oct 25.
- 195) **Kumarasamy N**, Patel A, Pujari S. [Antiretroviral therapy in Indian setting: when & what to start with, when & what to switch to?](#) *Indian J Med Res.* 2011 Dec;134(6):787-800.
- 196) Lim PL, Zhou J, Ditangco RA, Law MG, Sirisanthana T, **Kumarasamy N**, Chen YM, Phanuphak P, Lee CK, Saphonn V, Oka S, Zhang F, Choi JY, Pujari S, Kamarulzaman A, Li PC, Merati TP, Yuniastuti E, Messerschmidt L, Sungkanuparph S, Failure to prescribe pneumocystis prophylaxis is associated with increased mortality, even in the cART era: results from the Treat Asia HIV Observational Database. *Tahod TA. J Int AIDS Soc.* 2012 Jan 26;15(1):1.
- 197) Saravanan S, Madhavan V, Solomon SS, Kantor R, Katzenstein D, Sivamalar S, **Kumarasamy N**, Smith DM, Mayer KH, Solomon S, Balakrishnan P. Reverse Transcriptase Substitution at Codons 208 and 228 Among Treatment-Experienced

- HIV-1 Subtype-C-Infected Indian Patients Is Strongly Associated With Thymidine Analogue Mutations. *J Acquir Immune Defic Syndr*. 2012 Feb 1;59(2):e26-7.
- 198) Saravanan S, Vidya M, Balakrishnan P, Kantor R, Solomon SS, Katzenstein D, **Kumarasamy N**, Yeptom T, Sivamalar S, Rifkin S, Mayer KH, Solomon S. [Viremia and HIV-1 drug resistance mutations among patients receiving second-line highly active antiretroviral therapy in Chennai, Southern India](#). *Clin Infect Dis*. 2012 Apr;54(7):995-1000. Epub 2012 Feb 9.
- 199) Saravanan S, Madhavan V, Kantor R, Sivamalar S, Gomathi S, Solomon SS, **Kumarasamy N**, Smith DM, Schooley R M D, Solomon S, Pachamuthu B. [Unusual insertion and deletion at codon 67 and 69 of HIV-1 subtype C reverse transcriptase among first-line HAART failing South Indian patients: association with other resistance mutations](#). *AIDS Res Hum Retroviruses*. 2012 Mar 10. [Epub ahead of print]
- 200) Bartlett JA, Ribaudo HJ, Wallis CL, Aga E, Katzenstein DK, Stevens WS, Norton MR, Klingman KL, Hosseinipour MC, Crump JA, Supparatpinyo K, Badal-Faesen S, Kallungal BA, **Kumarasamy N**. [Lopinavir/ritonavir Monotherapy After Virologic Failure of First-line Antiretroviral Therapy in Resource-limited Settings](#). *AIDS*. 2012 Jul 17;26(11):1345-54.
- 201) Zhou J, Tanuma J, Chaiwarith R, Lee CK, Law MG, **Kumarasamy N**, Phanuphak P, Chen YM, Kiertiburanakul S, Zhang F, Vonthanak S, Ditangco R, Pujari S, Choi JY, Parwati Merati T, Yuniastuti E, Li PC, Kamarulzaman A, Nguyen VK, Thuy Pham TT, Lim PL. [Loss to Followup in HIV-Infected Patients from Asia-Pacific Region: Results from TAHOD](#). *AIDS Res Treat*. 2012;2012:375217. Epub 2012 Feb 22.
- 202) [Nelson M, Amaya G, Clumeck N, Arns da Cunha C, Jayaweera D, Junod P, Li T, Tebas P, Stevens M, Buelens A, Vanveggel S, Boven K, Kumarasamy N, on behalf of the ECHO and THRIVE Study Groups](#). Efficacy and safety of rilpivirine in treatment-naive, HIV-1-infected patients with hepatitis B virus/hepatitis C virus coinfection enrolled in the Phase III randomized, double-blind ECHO and THRIVE trials. *J Antimicrob Chemother*. 2012 Apr 24. [Epub ahead of print].
- 203) Kartik K Venkatesh, Suneetha Saghayam, Bella Devaleenal, S Poongulali, Timothy P Flanigan, Kenneth H Mayer, **N Kumarasamy**. Spectrum of malignancies among HIV infected patients in South India. *Indian Journal of Cancer | January-March 2012 | Volume 49 | Issue 1:15-19*.
- 204) Robertson K, Jiang H, Kumwenda J, Supparatpinyo K, Evans S, Campbell TB, Price R, Tripathy S, **Kumarasamy N**, La Rosa A; the 5199 study team, Santos B, Silva M, Montano S, Kanyama C, Faesen S, Murphy R, Hall C, Marra C, Marcus C, Berzins B, Allen R, Housseinipour M, Amod F, Sanne I, Hakim J, Walawander A, Nair A; the AIDS Clinical Trials Group. Improved Neuropsychological and Neurological Functioning

- Across Three Antiretroviral Regimens in Diverse Resource Limited Settings: AIDS Clinical Trials Group Study A5199, The International Neurological Study. Clin Infect Dis. 2012 Jun 1.
- 205) Pho MT, Swaminathan S, **Kumarasamy N**, Losina E, Ponnuraja C, Uhler LM, Scott CA, Mayer KH, Freedberg KA, Walensky RP. The Cost-Effectiveness of Tuberculosis Preventive Therapy for HIV-Infected Individuals in Southern India: A Trial-Based Analysis. PLoS One. 2012;7(4):e36001. Epub 2012 Apr 30.
- 206) Nielsen-Saines K, Komarow L, Cu-Uvin S, Jourdain G, Klingman KL, Shapiro DE, Mofenson L, Moran L, Campbell TB, Hitti J, Fiscus S, Currier J; **ACTG 5190/PACTG 1054 Study Team**. Infant outcomes after maternal antiretroviral exposure in resource-limited settings. Pediatrics. 2012 Jun;129(6):e1525-32. Epub 2012 May 14.
- 207) Calmy A, Balestre E, Bonnet F, Boulle A, Sprinz EE, Wood R, Delaporte E, Messou E, McIntyre J, Marhoum El Filaili K, Schechter M, **Kumarasamy N**, Bangsberg D, McPhail P, Van Der Borgh S, Zala C, Egger M, Thiebaut R, Dabis F. Mean CD4 cell count changes in patients failing a first-line antiretroviral therapy in resource-limited settings. BMC Infect Dis. 2012 Jun 28; 12(1) : 147 (Epub ahead of print).
- 208) Campbell TB, Smeaton LM, **Kumarasamy N**, Flanigan T, Klingman KL, Firnhaber C, Grinsztejn B, Hosseinipour MC, Kumwenda J, Lalloo U, Riviere C, Sanchez J, Melo M, Supparatpinyo K, Tripathy S, Martinez AI, Nair A, Walawander A, Moran L, Chen Y, Snowden W, Rooney JF, Uy J, Schooley RT, De Gruttola V, Hakim JG; PEARLS Study team of the ACTG. Efficacy and safety of three antiretroviral regimens for initial treatment of HIV-1: a randomized clinical trial in diverse multinational settings. PLoS Med. 2012 Aug;9 (8): e 1001290. Epub 2012 Aug 14.
- 209) Bharti Ar, Saravanan S, Madhavan V, Smith DM, Sharma J, Balakrishnan P, Letendre SL, **Kumarasamy N**. Correlates of HIV and malaria co-infection in Southern India. Malar.J. 2012 Sep 3;11(1):306. (Epub ahead of print).
- 210) **Kumarasamy N**, Venkatesh KK, Vignesh R, Devaleenal B, Poongulali S, Yephthomi T, Flanigan TP, Benson C, Mayer KH. Clinical outcomes among HIV-Tuberculosis coinfecting patients developing Immune Reconstitution Inflammatory Syndrome after HAART Initiation in South India. J Int Assoc Physicians AIDS Care (Chic). 2012 Sept 24. (Epub ahead of print).
- 211) Saravanan S, Madhavan V, Pachamuthu B, Smith DM, Solomon SS, Sivamalar S, Poongulali S, **Kumarasamy N**, Schooley R M D, Solomon S, Kantor R. Darunavir is a good third –line antiretroviral agent for HIV-1 infected patients failing second-line protease inhibitor-based regimens in South India. AIDS Res Hum Retroviruses. 2013 Mar;29(3):630.

- 212) Solomon SS, Lucas GM, **Kumarasamy N**, Yepthomi T, Balakrishnan P, Ganesh AK, Anand S, Moore RD, Solomon S, Mehta SH. Impact of generic antiretroviral therapy (ART) and free ART programs on time to initiation of ART at a tertiary HIV care center in Chennai, India. *AIDS Care*. 2012 Dec 7.
- 213) Rao UK, Ranganathan K, **Kumarasamy N**. Gender differences in oral lesions among persons with HIV disease in Southern India. *J Oral Maxillofac Pathol*. 2012 Sep;16(3):388-94.
- 214) 213) Bunupuradah T, Puthanakit T, Fahey P, Kariminia A, Yusoff NK, Khanh TH, Sohn AH, Chokephaibulkit K, Lumbiganon P, Hansudewechakul R, Razali K, Kurniati N, Huy BV, Sudjaritruk T, **Kumarasamy N**, Fong SM, Saphonn V, Ananworanich J; [Second-line protease inhibitor-based highly active antiretroviral therapy after failing non-nucleoside reverse transcriptase inhibitor-based regimens in Asian HIV-infected children](#). *Antivir Ther*. 2013 Jan 7.
- 215) 214) McMahon DK, Zheng L, Hitti J, Chan ES, Halvas EK, Hong F, Kabanda J, Taulo F, **Kumarasamy N**, Bonhomme J, Wallis CL, Klingman KL, Hughes MD, Mellors JW. [Greater Suppression of Nevirapine Resistance With 21- vs 7-Day Antiretroviral Regimens After Intrapartum Single-Dose Nevirapine for Prevention of Mother-to-Child Transmission of HIV](#). *Clin Infect Dis*. 2013 Apr;56(7):1044-51
- 216) 215) Byakwaga H, Petoumenos K, Ananworanich J, Zhang F, Boyd MA, Sirisanthana T, Li PC, Lee C, Mean CV, Saphonn V, Omar SF, Pujari S, Phanuphak P, Lim PL, **Kumarasamy N**, Chen YM, Merati TP, Sungkanuparph S, Ditangco R, Oka S, Tau G, Zhou J, Law MG, Emery S. [Predictors of Clinical Progression in HIV-1-Infected Adults Initiating Combination Antiretroviral Therapy with Advanced Disease in the Asia-Pacific Region: Results from the TREAT Asia HIV Observational Database](#). *J Int Assoc Provid AIDS Care*. 2013 Feb 19.
- 217) Jeyaraman VA, Sudharshan S, Selvakumar A, Bassi S, Noronha OV, Selvamuthu P, **Kumarasamy N**, Biswas J [Isolated cortical blindness without simultaneous neurological involvement in progressive multifocal leukoencephalopathy in a patient with human immune deficiency virus infection](#). *J Ophthalmic Inflamm Infect*. 2013 Jan 3;3(1):3. doi: 10.1186/1869-5760-3-3.
- 218) Sudharshan S, Kaleemunnisha S, Banu AA, Shrikrishna S, George AE, Babu BR, Devaleenal B, **Kumarasamy N**, Biswas J. [Ocular lesions in 1,000 consecutive HIV-positive patients in India: a long-term study](#). *J Ophthalmic Inflamm Infect*. 2013 Jan 3;3(1):2. doi: 10.1186/1869-5760-3-2.

- 219) Fiscus SA, Cu-Uvin S, Eshete AT, Hughes MD, Bao Y, Hosseinipour M, Grinsztejn B, Badal-Faesen S, Dragavon J, Coombs RW, Braun K, Moran L, Hakim J, Flanigan T, **Kumarasamy N**, Campbell TB; the A5185s Team. [Changes in HIV-1 Subtypes B and C Genital Tract RNA in Women and Men after Initiation of Antiretroviral Therapy](#). Clin Infect Dis. 2013 Mar 26.
- 220) Pavithra S, Ranganathan K, Rao UK, Joshua E, Rooban T, **Kumarasamy N**. [Impact of highly active antiretroviral therapy on salivary flow in patients with human-immunodeficiency virus disease in Southern India](#). J Oral Maxillofac Pathol. 2013 Jan;17(1):17-22.
- 221) Saran Vardhanabhuti; Edward P. Acosta; Heather J. Ribaud; Patrice Severe; Umesh Laloo; **N Kumarasamy**; Frank Taulo; Joseph Kabanda; Olola Oneko; Prudence Ive; Pradeep Sambarey; Ellen S. Chan; Jane Hitti; Francis Hong; Deborah McMahon; David W. Haas; the A5207 Study Team. Clinical and Genetic Determinants of Plasma Nevirapine Exposure following an Intrapartum Dose to Prevent Mother-to-Child Transmission .Journal of Infectious Diseases 2013; doi: 10.1093/infdis/jit223.
- 222) Saravanan S, Madhavan V, Velu V, Murugavel KG, Waldrop G, Solomon SS, Balakrishnan P, **Kumarasamy N**, Smith DM, Mayer KH, Solomon S, Thyagarajan SP. [High Prevalence of Hepatitis Delta Virus among Patients with Chronic Hepatitis B Virus Infection and HIV-1 in an Intermediate Hepatitis B Virus Endemic Region](#). J Int Assoc Provid AIDS Care. 2013 May 30.
- 223) Venkatesh KK, Becker JE, **Kumarasamy N**, Nakamura YM, Mayer KH, Elena Losina, Soumya Swaminathan, Timothy P. Flanigan, Rochelle P. Walensky, Kenneth A. Freedberg. (2013) Clinical Impact and Cost-Effectiveness of Expanded Voluntary HIV Testing in India. PLoS ONE 2013;8(5): e64604.
- 224) Bunupuradah T, Kariminia A, Chan KC, Ramautarsing R, Huy BV, Han N, Nallusamy R, Hansudewechakul R, Saphonn V, Sirisanthana V, Chokephaibulkit K, Kurniati N, **Kumarasamy N**, Yusoff NK, Razali K, Fong SM, Sohn AH, Lumbiganon P; on behalf of the TREAT Asia Pediatric HIV Observational Database. Incidence and predictors of severe anemia in Asian HIV-infected children using first-line antiretroviral therapy. Int J Infect Dis. 2013 Jun 10. doi:pii: S1201-9712(13)00174-4.
- 225) Boyd MA, **Kumarasamy N**, Moore CL, Nwizu C, Losso MH, Mohapi L, Martin A, Kerr S, Sohn AH, Teppler H, Van de Steen O, Molina JM, Emery S, Cooper DA. Ritonavir-boosted lopinavir plus nucleoside or nucleotide reverse transcriptase inhibitors versus ritonavir-boosted lopinavir plus raltegravir for treatment of HIV-1 infection in adults with virological failure of a standard first-line ART regimen (SECOND-LINE): a randomised, open-label, non-inferiority study. Lancet. 2013 Jun 15;381(9883):2091-9.

- 226) Vignesh R, **Kumarasamy N**, Lim A, Solomon S, Murugavel KG, Balakrishnan P, Solomon SS, Mayer KH, Swathirajan CR, Chandrasekaran E, Pradeep A, Poongulali S, Benson CA, French MA. [TB-IRIS after initiation of antiretroviral therapy is associated with expansion of pre-existent Th1 responses against Mycobacterium tuberculosis antigens.](#) J Acquir Immune Defic Syndr. 2013 Jun 14.
- 227) Solomon S, Balakrishnan P, Vignesh R, Waldrop G, Solomon SS, Murugavel KG, **Kumarasamy N**, Yepthomi T, Poongulali S, Swathirajan CR, Sreenivasan V, Chandrasekar C, Suriakumar J, Mahilmaran A, Manoharan G, Moore D. [A rapid and low-cost microscopic observation drug susceptibility assay for detecting TB and MDR-TB among individuals infected by HIV in South India.](#) Indian J Med Microbiol. 2013 Apr-Jun;31(2):130-7.
- 228) Fogel JM, Wang L, Parsons TL, Ou SS, Piwowar-Manning E, Chen Y, Mudhune VO, Hosseinipour MC, Kumwenda J, Hakim JG, Chariyalertsak S, Panchia R, Sanne I, **Kumarasamy N**, Grinsztejn B, Makhema J, Pilotto J, Santos BR, Mayer KH, McCauley M, Gamble T, Bumpus NN, Hendrix CW, Cohen MS, Eshleman SH. [Undisclosed antiretroviral drug use in a multi-national clinical trial \(HPTN 052\).](#) J Infect Dis. 2013 Aug 1.
- 229) Chokephaibulkit K, Kariminia A, Oberdorfer P, Nallusamy R, Bunupuradah T, Hansudewechakul R, Khanhdung KT, Saphonn V, **Kumarasamy N**, Lumbiganon P, Viet DC, Kurniati N, Yusoff NK, Razali K, Fong SM, Khanh TH, Wati DK, Sohn AH; for the TREAT Asia Pediatric HIV Observational Database. [Characterizing HIV Manifestations and Treatment Outcomes of Perinatally Infected Adolescents in Asia.](#) Pediatr Infect Dis J. 2013 Aug 12.
- 230) Han S, Zhou J, Lee M, Zhao H, Chen YM, **Kumarasamy N**, Pujari S, Lee C, Omar S, Ditangco R, Phanuphak N, Kiertiburanakul S, Chaiwarith R, Merati T, Yuniastuti E, Tanuma J, Saphonn V, Sohn A, Choi J; TREAT Asia HIV Observational Database. [Prognostic significance of the interval between the initiation of antiretroviral therapy and the initiation of anti-tuberculosis treatment in HIV/tuberculosis-coinfected patients: results from the TREAT Asia HIV Observational Database.](#) HIV Med. 2013 Aug 28. doi: 10.1111/hiv.12073.
- 231) Sungkanuparph S, Jiamsakul A, Kiertiburanakul S, Sirivichayakul S, Preparattanapan J, Kantor R; TREAT Asia Studies to Evaluate Resistance. Li P, Lee M, Wong KH, **Kumarasamy N**, Saghayam S, Pujari S, Joshi K, Merati T, Yuliana F, Kamarulzaman A, Ong L, Lee C, Sim B, Mustafa M, Nordin N, Zainab RP 2nd, Ditangco R, Bantique R, Chen Y, Chen Y, Lin Y, Kantipong P, Kambua P, Phanuphak P, Sirivichayakul S, Ratanasuwan W, Sriondee R, Sirisanthana T, Preparattanapan J, Sungkanuparph S, Kiertiburanakul S, Chumla L, Kantor R, Sohn A, Durier N, Singtoroj T, Cooper D, Law

- M, Jiamsakul A. Rilpivirine resistance-associated mutations among antiretroviral-naive patients infected with HIV-1 in Asia. *J Acquir Immune Defic Syndr*. 2013 Mar 1;62(3):e98-100.
- 232) Martin A, Moore C, Mallon PW, Hoy J, Emery S, Belloso W, Phanuphak P, Ferret S, Cooper DA, Boyd MA; Second Line study team, **Kumarasamy N**, Foulkes S, Wood R, Chetchotisakd P, Phanuphak P, Mohapi L, Kamarulzaman A, Messina O. Bone mineral density in HIV participants randomized to raltegravir and lopinavir/ritonavir compared with standard second line therapy. *AIDS*. 2013 Sep 24;27(15):2403-11.
- 233) **Kumarasamy N**, Krishnan S. Beyond first-line HIV treatment regimens: the current state of antiretroviral regimens, viral load monitoring, and resistance testing in resource-limited settings. *Curr Opin HIV AIDS*. 2013 Nov;8(6):586-90.
- 234) Walensky RP, Ross EL, **Kumarasamy N**, Wood R, Noubary F, Paltiel AD, Nakamura YM, Godbole SV, Panchia R, Sanne I, Weinstein MC, Losina E, Mayer KH, Chen YQ, Wang L, McCauley M, Gamble T, Seage GR 3rd, Cohen MS, Freedberg KA. Cost-effectiveness of HIV treatment as prevention in serodiscordant couples. *N Engl J Med*. 2013 Oct 31;369(18):1715-25.
- 235) Sudjaritruk T, Maleesatharn A, Prasitsuebsai W, Fong SM, Le NO, Le TT, Lumbiganon P, **Kumarasamy N**, Kurniati N, Hansudewechakul R, Nik Yusoff NK, Mohd Razali KA, Kariminia A, Sohn AH, Sirisanthana V. Prevalence, Characteristics, Management, and Outcome of Pulmonary Tuberculosis in HIV-Infected Children in the TREAT Asia Pediatric HIV Observational Database (TAPHOD). *AIDS Patient Care STDS*. 2013 Nov 9.
- 236) Prasitsuebsai W, Kariminia A, Puthanakit T, Lumbiganon P, Hansudewechakul R, Moy FS, Law M, Kumarasamy N, Razali K, Sirisanthana V, Sohn AH, Chokephaibulkit K. Impact of Antiretroviral Therapy on Opportunistic Infections of HIV-Infected Children in the TREAT Asia Pediatric HIV Observational Database. *Pediatr Infect Dis J*. 2013 Dec 30.
- 237) Périssé AR, Smeaton L, Chen Y, La Rosa A, Walawander A, Nair A, Grinsztejn B, Santos B, Kanyama C, Hakim J, Nyirenda M, Kumarasamy N, Lalloo UG, Flanigan T, Campbell TB, Hughes MD; P E A R L S study team of the ACTG. Outcomes among HIV-1 Infected Individuals First Starting Antiretroviral Therapy with Concurrent Active TB or Other AIDS-Defining Disease. *PLoS One*. 2013 Dec 31;8(12):e83643.
- 238) Phanuphak P, Sirivichayakul S, Jiamsakul A, Sungkanuparph S, Kumarasamy N, Lee MP, Sirisanthana T, Kantipong P, Lee C, Kamarulzaman A, Mustafa M, Ditangco R, Merati T, Ratanasuwan W, Singtoroj T, Kantor R. Transmitted Drug Resistance and Antiretroviral Treatment Outcomes in Non-Subtype B HIV1- Infected Patients in South East Asia. *J Acquir Immune Defic Syndr*. 2014 Jan 9.

- 239) IeDEA and ART Cohort Collaborations, Avila D, Althoff KN, Mugglin C, Wools-Kaloustian K, Koller M, Dabis F, Nash D, Gsponer T, Sungkanuparph S, McGowan C, May M, Cooper D, Chimbetete C, Wolff M, Collier A, McManus H, Davies MA, Costagliola D, Crabtree-Ramirez B, Chaiwarith R, Cescon A, Cornell M, Diero L, Phanuphak P, Sawadogo A, Ehmer J, Eholie SP, Li PC, Fox MP, Gandhi NR, González E, Lee CK, Hoffmann CJ, Kambugu A, Keiser O, Ditangco R, Prozesky H, Lampe F, Kumarasamy N, Kitahata M, Lugina E, Lyamuya R, Vonthanak S, Fink V, d'Arminio Monforte A, Luz PM, Chen YM, Minga A, Casabona J, Mwangi A, Choi JY, Newell ML, Bukusi EA, Ngonyani K, Merati TP, Otieno J, Bosco MB, Phiri S, Ng OT, Anastos K, Rockstroh J, Santos I, Oka S, Somi G, Stephan C, Teira R, Wabwire D, Wandeler G, Bouille A, Reiss P, Wood R, Chi BH, Williams C, Sterne JA, Egger M. Immunodeficiency at the start of combination antiretroviral therapy in low-, middle-, and high-income countries. *J Acquir Immune Defic Syndr*. 2014 Jan 1;65(1)
- 240) Kiertiburanakul S, Boettiger D, Lee MP, Omar SF, Tanuma J, Ng OT, Durier N, Phanuphak P, Ditangco R, Chaiwarith R, Kantipong P, Lee CK, Mustafa M, Saphonn V, Ratanasuwana W, Merati TP, Kumarasamy N, Wong WW, Zhang F, Pham TT, Pujari S, Choi JY, Yuniastuti E, Sungkanuparph S; TREAT Asia HIV Observational Databases (TAHOD) and the TREAT Asia Studies to Evaluate Resistance (TASER). Trends of CD4 cell count levels at the initiation of antiretroviral therapy over time and factors associated with late initiation of antiretroviral therapy among Asian HIV-positive patients. *J Int AIDS Soc*. 2014 Mar 14;17(1):18804.
- 241) Grinsztejn B, Hosseinipour MC, Ribaudo HJ, Swindells S, Eron J, Chen YQ, Wang L, Ou SS, Anderson M, McCauley M, Gamble T, Kumarasamy N, Hakim JG, Kumwenda J, Pilotto JH, Godbole SV, Chariyalertsak S, de Melo MG, Mayer KH, Eshleman SH, Piwowar-Manning E, Makhema J, Mills LA, Panchia R, Sanne I, Gallant J, Hoffman I, Taha TE, Nielsen-Saines K, Celentano D, Essex M, Havlir D, Cohen MS; the HPTN 052-ACTG Study Team. Effects of early versus delayed initiation of antiretroviral treatment on clinical outcomes of HIV-1 infection: results from the phase 3 HPTN 052 randomised controlled trial. *Lancet Infect Dis*. 2014 Mar 3.
- 242) Wallis CL, Aga E, Ribaudo H, Saravanan S, Norton M, Stevens W, **Kumarasamy N**, Bartlett J, Katzenstein D; on behalf of the A5230 team. Drug Susceptibility and Resistance Mutations After First-Line Failure in Resource Limited Settings. *Clin Infect Dis*. 2014 May 1.
- 243) Havers F, Smeaton L, Gupte N, Detrick B, Bollinger RC, Hakim J, **Kumarasamy N**, Andrade A, Christian P, Lama JR, Campbell TB, Gupta A; ACTG PEARLS and NWCS 319 Study Teams. 25-Hydroxyvitamin D Insufficiency and Deficiency is Associated With HIV Disease Progression and Virological Failure Post-Antiretroviral Therapy Initiation in Diverse Multinational Settings. *J Infect Dis*. 2014 Jul 15;210(2):244-53.

- 244) Jiamsakul A, **Kumarasamy N**, Ditangco R, C K Li P, Phanuphak P, Sirisanthana T, Sungkanuparph S, Kantipong P, K C Lee C, Mustafa M, Merati T, Kamarulzaman A, Singtoroj T, Law M; TREAT Asia Studies to Evaluate Resistance Monitoring Study (TASER-M). Factors associated with suboptimal adherence to antiretroviral therapy in Asia. *J Int AIDS Soc.* 2014 May 16;17:18911.
- 245) Essajee S, **Kumarasamy N**. The monitoring of adults and children on antiretroviral therapy in the 2013 WHO consolidated ARV guidelines. *AIDS.* 2014 Mar;28 Suppl 2:S147-9
- 246) Blutinger EJ, Solomon S, Srikrishnan AK, Thamburaj E, **Kumarasamy N**, Balakrishnan P, Anand S, Ganesh AK, Solomon SS. Dropout from care among HIV-infected patients enrolled in care at a tertiary HIV care center in Chennai, India. *AIDS Care.* 2014 Jul 11:1-6.
- 247) Marrazzo JM, del Rio C, Holtgrave DR, Cohen MS, Kalichman SC, Mayer KH, Montaner JS, Wheeler DP, Grant RM, Grinsztejn B, **Kumarasamy N**, Shoptaw S, Walensky RP, Dabis F, Sugarman J, Benson CA. HIV prevention in clinical care settings: 2014 recommendations of the International Antiviral Society-USA Panel. *JAMA.* 2014 Jul 23-30;312(4):390-409
- 248) Safren SA, Biello KB, Smeaton L, Mimiaga MJ, Walawander A, Lama JR, Rana A, Nyirenda M, Kayoyo VM, Samaneka W, Joglekar A, Celentano D, Martinez A, Remmert JE, Nair A, Laloo UG, **Kumarasamy N**, Hakim J, Campbell TB; PEARLS (ACTG A5175) Study Team. Psychosocial predictors of non-adherence and treatment failure in a large scale multi-national trial of antiretroviral therapy for HIV: data from the ACTG A5175/PEARLS trial. *PLoS One.* 2014 Aug 25;9(8)
- 249) Chandrasekar Lakshmi K, Sankarapandiyan S, **Nagalingeswaran Kumarasamy**, Kindo A, Ganesan N. Oral candidal carriage, salivary lysozyme levels, and their relationship with CD4 count in HIV-infected patients. *J Investig Clin Dent.* 2014 Aug 30.
- 250) Boettiger DC, Kerr S, Ditangco R, Merati TP, Pham TT, Chaiwarith R, Kiertiburanakul S, Li CK, **Kumarasamy N**, Vonthanak S, Lee C, Van Kinh N, Pujari S, Wong WW, Kamarulzaman A, Zhang F, Yuniastuti E, Choi JY, Oka S, Ng OT, Kantipong P, Mustafa M, Ratanasuwan W, Sohn A, Law M. Trends in First-Line Antiretroviral Therapy in Asia: Results from the TREAT Asia HIV Observational Database. *PLoS One.* 2014 Sep 3;9(9)
- 251) Boettiger DC, Saphonn V, Lee MP, Phanuphak P, Pham TT, Heng Sim BL, **Kumarasamy N**, Van Nguyen K, Kantipong P, Kamarulzaman A, Chaiwarith R, Kiertiburanakul S, Law MG. A clinical prediction tool for targeted pre-antiretroviral therapy creatinine testing applied to the TREAT Asia HIV Observational Database cohort. *J Acquir Immune Defic Syndr.* 2014 Sep 5.

- 252) Touzard Romo F, Smeaton LM, Campbell TB, Riviere C, Mngqibisa R, Nyirenda M, Supparatpinyo K, **Kumarasamy N**, Hakim JG, Flanigan TP. [Renal and Metabolic Toxicities Following Initiation of HIV-1 Treatment Regimen in a Diverse, Multinational Setting: A Focused Safety Analysis of ACTG PEARLS \(A5175\)](#). HIV Clin Trials. 2014 Nov-Dec;15(6):246-60.
- 253) Ford N, Meintjes G, Pozniak A, Bygrave H, Hill A, Peter T, Davies MA, Grinsztejn B, Calmy A, Kumarasamy N, Phanuphak P, deBeaudrap P, Vitoria M, Doherty M, Stevens W, Siberry GK. Ford N, Meintjes G, Pozniak A, Bygrave H, Hill A, Peter T, Davies MA, Grinsztejn B, Calmy A, **Kumarasamy N**, Phanuphak P, deBeaudrap P, Vitoria M, Doherty M, Stevens W, Siberry GK. [The future role of CD4 cell count for monitoring antiretroviral therapy. The future role of CD4 cell count for monitoring antiretroviral therapy](#). Lancet Infect Dis. 2014 Nov 19. pii: S1473-3099(14)70896-5.
- 254) Anita Shet, Ayesha De Costa, **N Kumarasamy**, Rashmi Rodrigues, Bharat Bhusan Rewari, Per Ashorn, Bo Eriksson, Vinod Diwan, and the HIVIND Study Team .Effect of mobile telephone reminders on treatment outcome in HIV: evidence from a randomised controlled trial in India. BMJ 2014;349:g5978 doi: 10.1136/bmj.g5978.
- 255) Kantor R, Smeaton L, Vardhanabhuti S, Hudelson SE, Wallis CL, Tripathy S, Morgado MG, Saravanan S, Balakrishnan P, Reitsma M, Hart S, Mellors JW, Halvas E, Grinsztejn B, Hosseinipour MC, Kumwenda J, La Rosa A, Lalloo UG, Lama JR, Rassool M, Santos BR, Supparatpinyo K, Hakim J, Flanigan T, **Kumarasamy N**, Campbell TB, Eshleman SH; on behalf of the A5175 Study Team. Pre-Treatment HIV Drug Resistance and HIV-1 Subtype C are Independently Associated with Virologic Failure: Results from the Multi-national PEARLS (ACTG A5175) Clinical Trial. Clin Infect Dis. 2015 Feb 13. pii: civ102.
- 256) **Kumarasamy N**, Aga E, Ribaldo HJ, Wallis CL, Katzenstein DA, Stevens WS, Norton MR, Klingman KL, Hosseinipour MC, Crump JA, Supparatpinyo K, Badal-Faesen S, Bartlett JA. Lopinavir/Ritonavir Monotherapy as Second-line Antiretroviral Treatment in Resource-Limited Settings: Week 104 Analysis of AIDS Clinical Trials Group (ACTG) A5230. Clin Infect Dis. 2015 May 15;60(10):1552-8.
- 257) INSIGHT Strategic Timing of AntiRetroviral Treatment (START) Study Group** .Why START? Reflections that led to the conduct of this large long-term strategic HIV trial. HIV Med. 2015 Apr;16 Suppl 1:1-9.
- 258) Tenforde MW, Gupte N, Dowdy DW, Asmuth DM, Balagopal A, Pollard RB, Sugandhavesa P, Lama JR, Pillay S, Cardoso SW, Pawar J, Santos B, Riviere C, Mwelase N, Kanyama C, Kumwenda J, Hakim JG, **Kumarasamy N**, Bollinger R, Semba RD, Campbell TB, Gupta A; ACTG PEARLS and NWCS 319 Study Group. C-reactive protein (CRP), interferon gamma-inducible protein 10 (IP-10), and lipopolysaccharide (LPS)

- are associated with risk of tuberculosis after initiation of antiretroviral therapy in resource-limited settings. *PLoS One*. 2015 Feb 26;10(2):e0117424.
- 259) Violari A, Bologna R, **Kumarasamy N**, Pilotto JH, Hendrickx A, Kakuda TN, Lathouwers E, Opsomer M, Van de Castele T, Tomaka FL. Safety and efficacy of darunavir/ritonavir in treatment-experienced pediatric patients: week 48 results of the ARIEL trial. *Pediatr Infect Dis J*. 2015 May;34(5):e132-7.
- 260) Amin J, Boyd MA, **Kumarasamy N**, Moore CL, Losso MH, Nwizu CA, Mohapi L, Kerr SJ, Sohn AH, Teppler H, Renjifo B, Molina JM, Emery S, Cooper DA. Raltegravir non-inferior to nucleoside based regimens in second-line therapy with lopinavir/ritonavir over 96 weeks: a randomised open label study for the treatment of **HIV**-1 infection. *PLoS One*. 2015 Feb 27;10(2):e0118228.
- 261) **Kumarasamy N**, Pendse R. Long term impact of antiretroviral therapy--can we end **HIV** epidemic, the goal beyond 2015. *Indian J Med Res*. 2014 Dec;140(6):701-3.
- 262) Lee MP, Zhou J, Messerschmidt L, Honda M, Ditangco R, Sirisanthana T, **Kumarasamy N**, Phanuphak P, Chen YM, Zhang F, Saphonn V, Kiertiburanakul S, Lee CK, Pujari S, Choi JY, Kamarulzaman A, Yunihastuti E, Merati TP, Lim PL, Li PC; TREAT Asia **HIV** Observational Database. Impact of Gender on Long-Term Treatment Outcomes of Highly Active Antiretroviral Therapy (HAART) in the TREAT Asia **HIV** Observational Database. *AIDS Patient Care STDS*. 2015 May;29(5):229-31.
- 263) Talaat KR, Babu S, Menon P, **Kumarasamy N**, Sharma J, Arumugam J, Dhakshinamurthy K, Srinivasan R, Poongulali S, Gu W, Fay MP, Swaminathan S, Nutman TB. Treatment of *W. bancrofti* (Wb) in **HIV**/Wb coinfections in South India. *PLoS Negl Trop Dis*. 2015 Mar 20;9(3):e0003622.
- 264) Saravanan S, Gomathi S, Kausalya B, Boobalan J, Murugavel KG, Balakrishnan P, Mothi SN, Solomon SS, **Kumarasamy N**, Selvamuthu P, Solomon S, Smith DM. Differences in Evolution of **HIV**-1 Subtype C Reverse Transcriptase Between Children and Adults Likely Explained by Maturity of Cytotoxic T-Lymphocyte Responses. *AIDS Res Hum Retroviruses*. 2015 Jun;31(6):655-7.
- 265) Ahn JY, Boettiger D, Law M, **Kumarasamy N**, Yunihastuti E, Chaiwarith R, Lee MP, Sim BL, Oka S, Wong W, Kamarulzaman A, Kantipong P, Phanuphak P, Ng OT, Kiertiburanakul S, Zhang F, Pujari S, Ditangco R, Ratanasuwan W, Merati TP, Saphonn V, Sohn AH, Choi JY. Effects of CD4 monitoring frequency on clinical endpoints in clinically stable **HIV**-infected patients with viral suppression. *J Acquir Immune Defic Syndr*. 2015 Apr 4.

- 266) Aurbibul L, Bunupuradah T, Sophan S, Boettiger D, Wati DK, Nguyen LV, Saphonn V, Hansudewechakul R, Chokephaibulkit K, Lumbiganon P, Truong KH, Do VC, **Kumarasamy N**, Yusoff NK, Razali K, Kurniati N, Fong SM, Nallusamy R, Sohn AH; TREAT Asia Pediatric **HIV** Observational Database. Prevalence and Incidence of Liver Dysfunction and Assessment of Biomarkers of Liver Disease in **HIV**-Infected Asian Children. *Pediatr Infect Dis J*. 2015 Jun;34(6):e153-8.
- 267) Firnhaber C, Smeaton LM, Grinsztejn B, Laloo U, Faesen S, Samaneka W, Infante R, Rana A, **Kumarasamy N**, Hakim J, Campbell TB. Differences in antiretroviral safety and efficacy by sex in a multinational randomized clinical trial. *HIV Clin Trials*. 2015 May-Jun;16(3):89-99.
- 268) Menezes LJ, Poongulali S, Tommasino M, Lin HY, **Kumarasamy N**, Fisher KJ, Saravanan S, Gheit T, Ezhilarasi C, Jeeva A, Lu B, Giuliano AR. Prevalence and concordance of human papillomavirus infection at multiple anatomic sites among **HIV**-infected women from Chennai, India. *Int J STD AIDS*. 2015 May 22.
- 269) Safren SA, Mayer KH, Ou SS, McCauley M, Grinsztejn B, Hosseinipour MC, **Kumarasamy N**, Gamble T, Hoffman I, Celentano D, Chen YQ, Cohen MS; HPTN 052 Study Team. Adherence to Early Antiretroviral Therapy: Results From HPTN 052, a Phase III, Multinational Randomized Trial of ART to Prevent **HIV**-1 Sexual Transmission in Serodiscordant Couples. *J Acquir Immune Defic Syndr*. 2015 Jun 1;69(2):234-40.
- 270) Balagopal A, Asmuth DM, Yang WT, Campbell TB, Gupte N, Smeaton L, Kanyama C, Grinsztejn B, Santos B, Supparatpinyo K, Badal-Faesen S, Lama JR, Laloo UG, Zulu F, Pawar JS, Riviere C, **Kumarasamy N**, Hakim J, Li XD, Pollard RB, Semba RD, Thomas DL, Bollinger RC, Gupta A; ACTG PEARLS and NWCS 319 Study team. Pre-cART Elevation of CRP and CD4+ T-cell Immune Activation Associated with **HIV** Clinical Progression in a Multinational Case-Cohort Study. *J Acquir Immune Defic Syndr*. 2015 May 21.
- 271) Boettiger DC, Kerr S, Ditangco R, Chaiwarith R, Li PC, Merati TP, Pham TT, Kiertiburanakul S, **Kumarasamy N**, Vonthanak S, Lee CK, Van Kinh N, Pujari S, Wong WW, Kamarulzaman A, Zhang F, Yunihastuti E, Choi JY, Oka S, Ng OT, Kantipong P, Mustafa M, Ratanasuwan W, Durier N, Law M; TREAT Asia **HIV** Observational Database. Tenofovir-based antiretroviral therapy in HBV-**HIV** coinfection: results from the TREAT Asia **HIV** Observational Database. *Antivir Ther*. 2015 Jun 12.
- 272) Shet A, Neogi U, **Kumarasamy N**, DeCosta A, Shastri S, Rewari BB. Virological efficacy with first-line antiretroviral treatment in India: predictors of viral failure and evidence of viral resuppression. *Trop Med Int Health*. 2015 Jul 3.

- 273) Derache A, Wallis CL, Vardhanabhuti S, Bartlett J, **Kumarasamy N**, Katzenstein D. Phenotype, Genotype, and Drug Resistance in Subtype C HIV-1 Infection. *J Infect Dis*. 2015 Jul 14.
- 274) **INSIGHT START Study Group**. [Initiation of Antiretroviral Therapy in Early Asymptomatic HIV Infection](#). *N Engl J Med*. 2015 Aug 27;373(9):795-807
- 275) Erlandson KM, Taejaroenkul S, Smeaton L, Gupta A, Singini IL, Lama JR, Mngqibisa R, Firnhaber C, Cardoso SW, Kanyama C, Machado da Silva AL, Hakim JG, **Kumarasamy N**, Campbell TB, Hughes MD. A Randomized Comparison of Anthropomorphic Changes With Preferred and Alternative Efavirenz-Based Antiretroviral Regimens in Diverse Multinational Settings. *Open Forum Infect Dis*. 2015 Jun 24;2(3):
- 276) Shet A, **Kumarasamy N**, Poongulali S, Shastri S, Kumar DS, Rewari BB, Arumugam K, Antony J, DeCosta A, D'souza G. Longitudinal Analysis of Adherence to First-Line Antiretroviral Therapy: Evidence of Treatment Sustainability from an Indian HIV Cohort. *Curr HIV Res*. 2015 Aug 25.
- 277) Jeong SJ, Italiano C, Chaiwarith R, Ng OT, Vanar S, Jiamsakul A, Saphonn V, Nguyen KV, Kiertiburanakul S, Lee MP, Merati TP, Pham TT, Yunihastuti E, Ditangco R, **Kumarasamy N**, Zhang F, Wong W, Sim BL, Pujari S, Kantipong P, Phanuphak P, Ratanasuwana W, Oka S, Mustafa M, Durier N, Choi JY. Late Presentation into Care of HIV Disease and Its Associated Factors in Asia: Results of TAHOD. *AIDS Res Hum Retroviruses*. 2015 Oct 15
- 278) Shet A, Bhavani PK, **Kumarasamy N**, Arumugam K, Poongulali S, Elumalai S, Swaminathan S. [Anemia, diet and therapeutic iron among children living with HIV: a prospective cohort study](#). *BMC Pediatr*. 2015 Oct 19;15(1):164.
- 279) Hitti J, Halvas EK, Zheng L, Panousis CG, Kabanda J, Taulo F, **Kumarasamy N**, Pape JW, Lalloo U, Sprenger H, Klingman KL, Chan ES, McMahon D, Mellors JW. Frequency of Antiretroviral Resistance Mutations among Infants Exposed to Single-Dose Nevirapine and Short Course Maternal Antiretroviral Regimens: ACTG A5207. *J AIDS Clin Res*. 2014 Nov;5(11).
- 280) Robertson K, Jiang H, Evans SR, Marra CM, Berzins B, Hakim J, Sacktor N, Silva MT, Campbell TB, Nair A, Schouten J; With the 5271 study team, Kumwenda J, Supparatpinyo K, Tripathy S, **Kumarasamy N**, la Rosa A, Montano S, Mwafongo A, Firnhaber C, Sanne I, Naini L, Amod F, Walawander A; AIDS Clinical Trials Group. International neurocognitive normative study: neurocognitive comparison data in diverse resource-limited settings: AIDS Clinical Trials Group A5271. *J Neurovirol*. 2016 Jan 5.

- 281) Boettiger DC, Sudjaritruk T, Nallusamy R, Lumbiganon P, Rungmaitree S, Hansudewechakul R, **Kumarasamy N**, Bunupuradah T, Saphonn V, Truong KH, Yusoff NK, Do VC, Nguyen LV, Razali KA, Fong SM, Kurniati N, Kariminia A. Non-Nucleoside Reverse Transcriptase Inhibitor-Based Antiretroviral Therapy in Perinatally HIV-Infected, Treatment-Naïve Adolescents in Asia. *J Adolesc Health*. 2016 Jan 20.
- 282) **Kumarasamy N**, Poongulali S, Bollaerts A, Moris P, Beulah FE, Ayuk LN, Demoití MA, Jongert E, Ofori-Anyinam O. A Randomized, Controlled Safety, and Immunogenicity Trial of the M72/AS01 Candidate Tuberculosis Vaccine in HIV-Positive Indian Adults. *Medicine (Baltimore)*. 2016 Jan;95(3):
- 283) Boettiger DC, Aурpibul L, Hudaya DM, Fong SM, Lumbiganon P, Saphonn V, Truong KH, Hansudewechakul R, Nguyen LV, Do VC, Bunupuradah T, Choкеphaibulkit K, Yusoff NK, **Kumarasamy N**, Wati DK, Razali KA, Kariminia A; TREAT Asia Pediatric HIV Observational Database. Antiretroviral Therapy in Severely Malnourished, HIV-Infected Children in Asia. *Pediatr Infect Dis J*. 2016 Feb 1.
- 284) Fogel JM, Hudelson SE, Ou SS, Hart S, Wallis C, Morgado MG, Saravanan S, Tripathy S, Hovind L, Piwowar-Manning E, Sabin D, McCauley M, Gamble T, Zhang XC, Eron JJ, Gallant JE, Kumwenda J, Makhema J, **Kumarasamy N**, Chariyalertsak S, Hakim J, Badal-Faesen S, Akelo V, Hosseinipour MC, Santos BR, Godbole SV, Pilotto JH, Grinsztejn B, Panchia R, Mayer KH, Chen YQ, Cohen MS, Eshleman SH. HIV drug resistance in adults failing early antiretroviral treatment: results from the HIV Prevention Trials Network 052 trial. *J Acquir Immune Defic Syndr*. 2016 Feb 8.
- 285) Castillo-Mancilla JR, Aquilante CL, Wempe MF, Smeaton LM, Firnhaber C, LaRosa AM, **Kumarasamy N**, Andrade A, Baheti G, Fletcher CV, Campbell TB, Haas DW, MaWhinney S, Anderson PL. [Pharmacogenetics of unboosted atazanavir in HIV-infected individuals in resource-limited settings: a sub-study of the AIDS Clinical Trials Group \(ACTG\) PEARLS study \(NWCS 342\)](#). *J Antimicrob Chemother*. 2016 Feb 17.
- 286) Chen M, Wong WW, Law MG, Kiertiburanakul S, Yuniastuti E, Merati TP, Lim PL, Chaiwarith R, Phanuphak P, Lee MP, **Kumarasamy N**, Saphonn V, Ditangco R, Sim BL, Nguyen KV, Pujari S, Kamarulzaman A, Zhang F, Pham TT, Choi JY, Oka S, Kantipong P, Mustafa M, Ratanasuwana W, Durier N, Chen YM. [Hepatitis B and C Co-Infection in HIV Patients from the TREAT Asia HIV Observational Database: Analysis of Risk Factors and Survival](#). *PLoS One*. 2016 Mar 2;11(3):e0150512
- 287) Jiamsakul A, Kerr SJ, Ng OT, Lee MP, Chaiwarith R, Yuniastuti E, Nguyen KV, Pham TT, Kiertiburanakul S, Ditangco R, Saphonn V, Sim BL, Merati TP, Wong W, Kantipong P, Zhang F, Choi JY, Pujari S, Kamarulzaman A, Oka S, Mustafa M, Ratanasuwana W, Petersen B, Law M, **Kumarasamy N**; TREAT Asia HIV Observational Database

- (TAHOD).[Effects of unplanned treatment interruptions on HIV treatment failure- results from TAHOD.](#) Trop Med Int Health. 2016 Mar 7.
- 288) De La Mata NL, **Kumarasamy N**, Khol V, Ng OT, Van Kinh N, Merati TP, Thuy PT, Lee MP, Durier N, Law M.[Improved survival in HIV treatment programmes in Asia.](#) Antivir Ther. 2016 Mar 10.
- 289) Mave V, Erlandson KM, Gupte N, Balgopal A, Asmuth DM, Campbell TB, Smeaton L, **Kumarasamy N**, Hakim J, Santos B, Riviere C, Hosseinipour MC, Sugandhavesa P, Infante R, Pillay S, Cardoso SW, Tripathy S, Mwelase N, Berendes S, Andrade BB, Thomas DL, Bollinger RC, Gupta A; ACTG PEARLS and NWCS 319 Study team. [Inflammation and Change in Body Weight with Antiretroviral Therapy Initiation in a Multinational Cohort of HIV-infected Adults.](#) J Infect Dis. 2016 Mar 8.
- 290) Hosseinipour MC, Bisson GP, Miyahara S, Sun X, Moses A, Riviere C, Kirui FK, Badal-Faesen S, Lagat D, Nyirenda M, Naidoo K, Hakim J, Mugenyi P, Henostroza G, Leger PD, Lama JR, Mohapi L, Alave J, Mave V, Veloso VG, Pillay S, **Kumarasamy N**, Bao J, Hogg E, Jones L, Zolopa A, Kumwenda J, Gupta A; Adult AIDS Clinical Trials Group A5274 (REMEMBER) Study Team. Empirical tuberculosis therapy versus isoniazid in adult outpatients with advanced HIV initiating antiretroviral therapy (REMEMBER): a multicountry open-label randomised controlled trial. Lancet. 2016 Mar 19;387(10024):1198-209. doi: 10.1016/S0140-6736(16)00546-8.
- 291) Solomon S, **Kumarasamy N**, Challacombe SJ. The social impact of HIV/AIDS in India. Oral Dis. 2016 Apr;22 Suppl 1:15-8.
- 292) **Kumarasamy N**. The impact of antiretroviral therapy in resource-limited settings and current HIV therapeutics. Oral Dis. 2016 Apr;22 Suppl 1:42-5.
- 293) La Rosa AM, Harrison LJ, Taiwo B, Wallis CL, Zheng L, Kim P, **Kumarasamy N**, Hosseinipour MC, Jarocki B, Mellors JW, Collier AC; ACTG A5273 Study Group. Raltegravir in second-line antiretroviral therapy in resource-limited settings (SELECT): a randomised, phase 3, non-inferiority study. Lancet HIV. 2016 Jun;3(6):e247-58.
- 294) Mathad JS, Gupte N, Balagopal A, Asmuth D, Hakim J, Santos B, Riviere C, Hosseinipour M, Sugandhavesa P, Infante R, Pillay S, Cardoso SW, Mwelase N, Mbchb, Pawar J, Berendes S, **Kumarasamy N**, Andrade BB, Campbell TB, Currier JS, Cohn SE, Gupta A; New Work Concept Sheet 319 and **AIDS** Clinical Trials Group A5175 (PEARLS) study teams. Sex-related Differences in Inflammatory and Immune Activation Markers before and after combined Antiretroviral Therapy Initiation. J Acquir Immune Defic Syndr. 2016 May 27.

- 295) Rachlis B, Karwa R, Chema C, Pastakia S, Olsson S, Wools-Kaloustian K, Jakait B, Maina M, Yotebieng M, **Kumarasamy N**, Freeman A, de Rekeneire N, Duda SN, Davies MA, Braitstein P. Targeted Spontaneous Reporting: Assessing Opportunities to Conduct Routine Pharmacovigilance for Antiretroviral Treatment on an International Scale. *Drug Saf.* 2016 Jun 9.
- 296) Lam EP, Moore CL, Gotuzzo E, Nwizu C, Kamarulzaman AB, Chetchotisakd P, van Wyk J, Teppler H, **Kumarasamy N**, Molina JM, Emery S, Cooper DA, Boyd MA. Antiretroviral resistance following first-line antiretroviral therapy failure in diverse HIV-1 subtypes clades in the SECOND-LINE study. *AIDS Res Hum Retroviruses.* 2016 Jun 26.
- 297) Huang A, Hogan JW, Luo X, DeLong A, Saravanan S, Wu Y, Sirivichayakul S, **Kumarasamy N**, Zhang F, Phanuphak P, Diero L, Buziba N, Istrail S, Katzenstein DA, Kantor R. Global Comparison of Drug Resistance Mutations After First-Line Antiretroviral Therapy Across Human **Immunodeficiency** Virus-1 Subtypes. *Open Forum Infect Dis.* 2015 Nov 3;3(2):ofv158
- 298) Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, **Kumarasamy N**, Hakim JG, Kumwenda J, Grinsztejn B, Pilotto JH, Godbole SV, Chariyalertsak S, Santos BR, Mayer KH, Hoffman IF, Eshleman SH, Piwowar-Manning E, Cottle L, Zhang XC, Makhema J, Mills LA, Panchia R, Faesen S, Eron J, Gallant J, Havlir D, Swindells S, Elharrar V, Burns D, Taha TE, Nielsen-Saines K, Celentano DD, Essex M, Hudelson SE, Redd AD, Fleming TR; HPTN 052 Study Team. Antiretroviral Therapy for the Prevention of **HIV**-1 Transmission. *N Engl J Med.* 2016 Sep 1;375(9):830-9.
- 299) Do TC, Boettiger D, Law M, Pujari S, Zhang F, Chaiwarith R, Kiertiburanakul S, Lee MP, Ditangco R, Wong WW, Nguyen KV, Merati TP, Pham TT, Kamarulzaman A, Oka S, Yuniastuti E, **Kumarasamy N**, Kantipong P, Choi JY, Ng OT, Durier N, Ruxrungtham K. Smoking and projected cardiovascular risk in an **HIV**-positive Asian regional cohort. *HIV Med.* 2016 Aug;17(7):542-9.
- 300) Boettiger DC, Muktiarti D, Kurniati N, Truong KH, Saghayam S, Ly PS, Hansudewechakul R, Van Nguyen L, Do VC, Sudjaritruk T, Lumbiganon P, Chokephaibulkit K, Bunupuradah T, Nik Yusoff NK, Wati DK, Mohd Razali KA, Fong MS, Nallusamy RA, Sohn AH, Kariminia A; Therapeutics Research, Education, and **AIDS** Training in Asia (TREAT Asia) Pediatric **HIV** Observational Database. Early Height and Weight Changes in Children Using Cotrimoxazole Prophylaxis With Antiretroviral Therapy. *Clin Infect Dis.* 2016 Jul 28.
- 301) Singini I, Campbell TB, Smeaton LM, **Kumarasamy N**, La Rosa A, Taejareonkul S, Safren SA, Flanigan TP, Hakim JG, Hughes MD; ACTG A5175/PEARLS Study Team. Predictors of late virologic failure after initial successful suppression of **HIV** replication on efavirenz-based antiretroviral therapy. *HIV Clin Trials.* 2016 Jul 29:1-8.

- 302) Jenks JD, **Kumarasamy N**, Ezhilarasi C, Poongulali S, Ambrose P, Yepthomi T, Devaraj C, Benson CA. Improved tuberculosis outcomes with daily vs. intermittent rifabutin in **HIV**-TB coinfecting patients in India. *Int J Tuberc Lung Dis*. 2016 Sep;20(9):1181-4.
- 303) Ku NS, Jiamsakul A, Ng OT, Yunihastuti E, Cuong do D, Lee MP, Sim BL, Phanuphak P, Wong WW, Kamarulzaman A, Zhang F, Pujari S, Chaiwarith R, Oka S, Mustafa M, **Kumarasamy N**, Van Nguyen K, Ditangco R, Kiertiburanakul S, Merati TP, Durier N, Choi JY; TREAT Asia **HIV** Observational Databases (TAHOD). Elevated CD8 T-cell counts and virological failure in **HIV**-infected patients after combination antiretroviral therapy. *Medicine (Baltimore)*. 2016 Aug;95(32):e4570.
- 304) Eshleman SH, Hudelson SE, Redd AD, Swanstrom R, Ou SS, Zhang XC, Ping LH, Piwowar-Manning E, Porcella SF, Sievers MF, Martens CA, Bruno D, Dukhovlinova E, McCauley M, Gamble T, Fogel JM, Sabin D, Quinn TC, Gunde L, Maliwichi M, Nhando N, Akelo V, Moyo S, Panchia R, **Kumarasamy N**, Chotirosniramit N, Gonçalves de Melo M, Pilotto J, Grinsztejn B, Mayer K, Chen YQ, Hughes JP, Cohen MS. Treatment as Prevention: Characterization of partner infections in the **HIV** Prevention Trials Network 052 trial. *J Acquir Immune Defic Syndr*. 2016 Aug 16.
- 305) Tanuma J, Jiamsakul A, Makane A, Avihingsanon A, Ng OT, Kiertiburanakul S, Chaiwarith R, **Kumarasamy N**, Nguyen KV, Pham TT, Lee MP, Ditangco R, Merati TP, Choi JY, Wong WW, Kamarulzaman A, Yunihastuti E, Sim BL, Ratanasuwana W, Kantipong P, Zhang F, Mustafa M, Saphonn V, Pujari S, Sohn AH; TREAT Asia **HIV** Observational Databases (TAHOD). Renal Dysfunction during Tenofovir Use in a Regional Cohort of **HIV**-Infected Individuals in the Asia-Pacific. *PLoS One*. 2016 Aug 25;11(8):e0161562
- 306) Chan BT, Pradeep A, Prasad L, Murugesan V, Chandrasekaran E, **Kumarasamy N**, Mayer KH. Prevalence and correlates of psychosocial conditions among people living with HIV in southern India. *AIDS Care*. 2016 Sep 18:1-5. PMID: 27643850
- 307) Vardhanabhuti S, Katzenstein D, Bartlett J, **Kumarasamy N**, Wallis CL. Human Immunodeficiency Virus-1 Sequence Changes and Drug Resistance Mutation Among Virologic Failures of Lopinavir/Ritonavir Monotherapy: AIDS Clinical Trials Group Protocol A5230. *Open Forum Infect Dis*. 2016 Aug 24;3(3):ofw154. PMID: 27704010
- 308) Matoga MM, Hosseinipour MC, Aga E, Ribaud HJ, **Kumarasamy N**, Bartlett J, Hughes MD; ACTG A5230 Study Team. Hyperlipidaemia in HIV-infected patients on lopinavir/ritonavir monotherapy in resource-limited settings. *Antivir Ther*. 2016 Oct 14. doi: 10.3851/IMP3101. PMID: 27740537

- 309) De La Mata NL, Ahn MY, **Kumarasamy N**, Ly PS, Ng OT, Nguyen KV, Merati TP, Pham TT, Lee MP, Durier N, Law MG. A pseudo-random patient sampling method evaluated. *J Clin Epidemiol*. 2016 Oct 19. pii: S0895-4356(16)30485-1.
PMID: 27771357
- 310) Huy BV, Teeraananchai S, Oanh LN, Tucker J, Kurniati N, Hansudewechakul R, Truong KH, Khol V, Nguyen LV, Chau Do V, Lumbiganon P, Kongstan N, Bunupuradah T, Sudjaritruk T, **Kumarasamy N**, Yusoff NK, Mohd Razali KA, Wati DK, Fong MS, Nallusamy R, Kariminia A, Sohn AH. Impact of orphan status on HIV treatment outcomes and retention in care of children and adolescents in Asia. *J Virus Erad*. 2016 Oct 5;2(4):227-231.
PMID: 27781105
- 311) Mohamed TJ, Teeraananchai S, Kerr S, Phongsamart W, Nik Yusoff NK, Hansudewechakul R, Ly PS, Nguyen LV, Sudjaritruk T, Lumbiganon P, Do VC, Kurniati N, **Kumarasamy N**, Wati DK, Fong MS, Nallusamy R, Kariminia A, Sohn AH. AIDS Res Hum Retroviruses. 2016 Oct 31. Impact of Viral Load Use on Treatment Switch in Perinatally HIV-Infected Children in Asia.
PMID: 27758114
- 312) Balagopal A, Gupte N, Shivakoti R, Cox AL, Yang WT, Berendes S, Mwelase N, Kanyama C, Pillay S, Samaneka W, Santos B, Poongulali S, Tripathy S, Riviere C, Lama JR, Cardoso SW, Sugandhavesa P, Semba RD, Hakim J, Hosseinipour MC, **Kumarasamy N**, Sanne I, Asmuth D, Campbell T, Bollinger RC, Gupta A. Continued Elevation of Interleukin-18 and Interferon- γ After Initiation of Antiretroviral Therapy and Clinical Failure in a Diverse Multicountry Human Immunodeficiency Virus Cohort. *Open Forum Infect Dis*. 2016 Jul 27;3(3):ofw118.
PMID: 27800521
- 313) Boyd MA, Amin J, Mallon PW, **Kumarasamy N**, Lombaard J, Wood R, Chetchotisakd P, Phanuphak P, Mohapi L, Azwa I, Belloso WH, Molina JM, Hoy J, Moore CL, Emery S, Cooper DA; SECOND-LINE Study Group. Body composition and metabolic outcomes after 96 weeks of treatment with ritonavir-boosted lopinavir plus either nucleoside or nucleotide reverse transcriptase inhibitors or raltegravir in patients with HIV with virological failure of a standard first-line antiretroviral therapy regimen: a substudy of the randomised, open-label, non-inferiority SECOND-LINE study. *Lancet HIV*. 2017 Jan;4(1):e13-e20.
PMID: 27815068
- 314) De La Mata NL, **Kumarasamy N**, Ly PS, Ng OT, Nguyen KV, Merati TP, Lee MP, Do CD, Choi JY, Ross JL, Law MG. Growing challenges for HIV programmes in Asia: clinic

- population trends, 2003-2013. *AIDS Care*. 2017 Jan 29;1-12. doi: 10.1080/09540121.2017.1282108.
PMID: 28132544
- 315) Lumbiganon P, Kosalaraksa P, Bunupuradah T, Boettiger D, Saphonn V, Truong KH, Kurniati N, Hansudewechakul R, Do VC, Sudjaritruk T, **Kumarasamy N**, Kongstan N, Yusoff NK, Nguyen LV, Wati DK, Razali K, Sohn AH, Kariminia A. HIV-infected children in the Asia-Pacific region with baseline severe anemia: antiretroviral therapy and outcomes. *Asian Biomed (Res Rev News)*. 2016 Jun;10(3):229-234.
PMID: 28239430
- 316) Puhr R, **Kumarasamy N**, Ly PS, Ng OT, Van Nguyen K, Merati TP, Pham TT, Lee MP, Choi JY, Ross JL, Law MG. HIV and Aging: Demographic Change in the Asia-Pacific Region. *J Acquir Immune Defic Syndr*. 2017 Apr 15;74(5):e146-e148.
PMID: 28267699
- 317) Rezwan K, Khan HS, Azim T, Pendse R, Sarkar S, **Kumarasamy N**. A success story: identified gaps and the way forward for low HIV prevalence in Bangladesh. *J Virus Erad*. 2016 Nov 28;2(Suppl 4):32-34.
PMID: 28275448
- 318) Chan BT, Pradeep A, Mayer KH, **Kumarasamy N**. Attitudes of Indian HIV Clinicians Toward Depression in People Living with HIV. *Ann Glob Health*. 2016 Sep - Oct;82(5):792-797.
PMID: 28283131
- 319) Celum C, Hong T, Cent A, Donnell D, Morrow R, Baeten JM, Firnhaber C, Grinsztejn B, Hosseinipour MC, Lalloo U, Nyirenda M, Riviere C, Sanchez J, Santos B, Supparatpinyo K, Hakim J, Kumarasamy N, Campbell TB; ACTG PEARLS/A5175 team. HSV-2 acquisition among HIV-1 infected adults treated with tenofovir as part of combination antiretroviral therapy: Results from the ACTG A5175 PEARLS study. *J Infect Dis*. 2017 Jan 30. PMID: 28329270
- 320) Eshleman SH, Wilson EA, Zhang XC, Ou SS, Piwowar-Manning E, Eron JJ, McCauley M, Gamble T, Gallant JE, Hosseinipour MC, Kumarasamy N, Hakim JG, Kalonga B, Pilotto JH, Grinsztejn B, Godbole SV, Chotirosniramit N, Santos BR, Shava E, Mills LA, Panchia R, Mwelase N, Mayer KH, Chen YQ, Cohen MS, Fogel JM. Virologic outcomes in early antiretroviral treatment: HPTN 052. *HIV Clin Trials*. 2017 Apr 7:1-10. PMID: 28385131
- 321) Erlandson KM, Fiorillo SP, Cardoso SW, Rivere C, Sanchez J, Hakim J, Kumarasamy N, Badal-Fasesen S, Lalloo U, Kumwenda JJ, Campbell TB, Brown T. Insulin-like Growth Factor is Associated with Changes in Body Composition with ART Initiation. *AIDS Res Hum Retroviruses*. 2017 Apr 12. doi: 10.1089/AID.2016.0327.

PMID: 28403619

- 322) Amole CD, Middlecote C, Prabhu VR, Kumarasamy N. Can the generic antiretroviral industry support access to a universal antiretroviral regimen? *Curr Opin HIV AIDS*. 2017 Apr 24. PMID: 28441147
- 323) Celum C, Hong T, Cent A, Donnell D, Morrow R, Baeten JM, Firnhaber C, Grinsztejn B, Hosseinipour MC, Lalloo U, Nyirenda M, Riviere C, Sanchez J, Santos B, Supparatpinoy K, Hakim J, Kumarasamy N, Campbell TB; ACTG PEARLS/A5175 Team. Herpes Simplex Virus Type 2 Acquisition Among HIV-1-Infected Adults Treated With Tenofovir Disoproxyl Fumarate as Part of Combination Antiretroviral Therapy: Results From the ACTG A5175 PEARLS Study. *J Infect Dis*. 2017 Mar 15;215(6):907-910. PMID: 28453835
- 324) Palumbo PJ, Wilson EA, Piwowar-Manning E, McCauley M, Gamble T, Kumwenda N, Makhema J, Kumarasamy N, Chariyalertsak S, Hakim JG, Hosseinipour MC, Melo MG, Godbole SV, Pilotto JH, Grinsztejn B, Panchia R, Chen YQ, Cohen MS, Eshleman SH, Fogel JM. Association of HIV diversity and virologic outcomes in early antiretroviral treatment: HPTN 052. *PLoS One*. 2017 May 8;12(5):e0177281. PMID: 28481902
- 325) Kiertiburanakul S, Boettiger D, Ng OT, Van Kinh N, Merati TP, Avihingsanon A, Wong WW, Lee MP, Chaiwarith R, Kamarulzaman A, Kantipong P, Zhang F, Choi JY, Kumarasamy N, Ditangco R, Cuong DD, Oka S, Sim BLH, Ratanasuwan W, Ly PS, Yunihastuti E, Pujari S, Ross JL, Law M, Sungkanuparph S; TREAT Asia HIV Observational Databases (TAHOD). Factors associated with pre-treatment HIV RNA: application for the use of abacavir and rilpivirine as the first-line regimen for HIV-infected patients in resource-limited settings. *AIDS Res Ther*. 2017 May 5;14:27. PMID: 28484509
- 326) De La Mata NL, Ly PS, Ng OT, Nguyen KV, Merati TP, Pham TT, Lee MP, Choi JY, Sohn AH, Law MG, Kumarasamy N. Trends in CD4 cell count response to first-line antiretroviral treatment in HIV-positive patients from Asia, 2003-2013: TREAT Asia HIV Observational Database Low Intensity Transfer. *Int J STD AIDS*. 2017 Jan 1
- 327) Kamat R, McCutchan A, Kumarasamy N, Marcotte TD, Umlauf A, Selvamuthu P, Meyer R, Letendre S, Heaton R, Bharti AR. Neurocognitive functioning among HIV-positive adults in southern India. *J Neurovirol*. 2017 Jul 5.
- 328) Jiamsakul A, Kariminia A, Althoff KN, Cesar C, Cortes CP, Davies MA, Do VC, Eley B, Gill J, Kumarasamy N, Machado DM, Moore R, Prozesky H, Zaniewski E, Law M.
- 329) HIV viral load suppression in adults and children receiving antiretroviral therapy - results from the leDEA collaboration. *J Acquir Immune Defic Syndr*. 2017 Jul 8.

- 330) Greer AE, Ou SS, Wilson E, Piwowar-Manning E, Forman MS, McCauley M, Gamble T, Ruangyuttikarn C, Hosseinipour MC, Kumarasamy N, Nyirenda M, Grinsztejn B, Pilotto JH, Kosashunhanan N, Gonçalves de Melo M, Makhema J, Akelo V, Panchia R, Badal-Faesen S, Chen YQ, Cohen MS, Eshleman SH, Thio CL, Valsamakis A.
- 331) A Comparison of Hepatitis B Virus Infection in HIV-infected and HIV-uninfected Participants Enrolled in a Multi-National Clinical Trial: HPTN 052. *J Acquir Immune Defic Syndr*. 2017 Jul 26.
- 332) Martinez-Vega R, De La Mata NL, Kumarasamy N, Ly PS, Van Nguyen K, Merati TP, Pham TT, Lee MP, Choi JY, Ross JL, Ng OT. Durability of antiretroviral therapy regimens and determinants for change in HIV-1-infected patients in the TREAT Asia HIV Observational Database (TAHOD-LITE). *Antivir Ther*. 2017 Sep 21. PMID:28933705
- 333) Jung IY, Boettiger D, Wong WW, Lee MP, Kiertiburanakul S, Chaiwarith R, Avihingsanon A, Tanuma J, Kumarasamy N, Kamarulzaman A, Zhang F, Kantipong P, Ng OT, Sim BLH, Law M, Ross J, Choi JY. The treatment outcomes of antiretroviral substitutions in routine clinical settings in Asia; data from the TREAT Asia HIV Observational Database (TAHOD). *J Int AIDS Soc*. 2017 Dec;20(4). PMID:29243388
- 334) Palumbo PJ, Fogel JM, Hudelson SE, Wilson EA, Hart S, Hovind L, Piwowar-Manning E, Wallis C, Papathanasopoulos MA, Morgado MG, Saravanan S, Tripathy S, Eron JJ, Gallant JE, Mph, McCauley M, Gamble T, Hosseinipour MC, **Kumarasamy N**, Hakim JG, Pilotto JH, Kumwenda J, Akelo V, Godbole SV, Santos BR, Grinsztejn B, Panchia R, Chariyalertsak S, Makhema J, Badal-Faesen S, Chen YQ, Cohen MS, Eshleman SH. [HIV Drug Resistance in Adults Receiving Early Versus Delayed Antiretroviral Therapy: HPTN 052](#). *J Acquir Immune Defic Syndr*. 2017 Dec 28. PMID: 29293156
- 335) Chan BT, Pradeep A, Prasad L, Murugesan V, Chandrasekaran E, **Kumarasamy N**, Mayer KH, Tsai AC. [Association between internalized stigma and depression among HIV-positive persons entering into care in Southern India](#). *J Glob Health*. 2017 Dec;7(2):020403. PMID: 29302315
- 336) **Kumarasamy N**, Sundaram S, Poongulali S, Ezhilarasi C, Pradeep A, Chitra D. Prevalence and factors associated with renal dysfunction in patients on tenofovir disoproxil fumarate-based antiretroviral regimens for HIV infection in Southern India. *J Virus Erad*. 2018 Jan 1;4(1):37-40. PMID:29568552

- 337) Zheng A, **Kumarasamy N**, Huang M, Paltiel AD, Mayer KH, Rewari BB, Walensky RP, Freedberg KA. The cost-effectiveness and budgetary impact of a dolutegravir-based regimen as first-line treatment of **HIV** infection in India. *J Int AIDS Soc.* 2018 Mar;21(3). PMID:29603882
- 338) Freedberg KA, **Kumarasamy N**, Borre ED, Ross EL, Mayer KH, Losina E, Swaminathan S, Flanigan TP, Walensky RP. Clinical Benefits and Cost-Effectiveness of Laboratory Monitoring Strategies to Guide Antiretroviral Treatment Switching in India. *AIDS Res Hum Retroviruses.* 2018 Jun;34(6):486-497. PMID:29620932
- 339) Bartlett AW, Khanh TH, Songtaweasin WN, Chokephaibulkit K, Hansudewechakul R, Ly PS, Lumbiganon P, Sudjaritruk T, Van Lam N, Viet DC, Kumarasamy N, Yusoff NKN, Kurniati N, Fong MS, Wati DK, Nallusamy R, Sohn AH, Law MG, Mohamed TJ. Characteristics, mortality and outcomes at transition for adolescents with perinatal HIV infection in Asia. *AIDS.* 2018 May 22. PMID:29794827
- 340) Saravanan S, Gomathi S, DeLong A, Kausalya B, Sivamalar S, Poongulali S, Brooks K, Kumarasamy N, Balakrishnan P, Solomon SS, Cu-Uvin S, Kantor R. High discordance in blood and genital tract HIV-1 drug resistance in Indian women failing first-line therapy. *J Antimicrob Chemother.* 2018 May 24. PMID:29800305
- 341) Aurrpibul L, Kariminia A, Vibol U, Fong MS, Le ON, Hansudewechakul R, Bunupuradah T, Kurniati N, Chokephaibulkit K, Kumarasamy N, Wati DK, Yusoff NKN, Razali KAM, Nallusamy RA, Sohn AH, Lumbiganon P; TREAT Asia Pediatric HIV Observational Database (TApHOD) of IeDEA Asia-Pacific. Seroprevalence of Hepatitis B among HIV-infected Children and Adolescents Receiving Antiretroviral Therapy in the TREAT Asia Pediatric HIV Observational Database. *Pediatr Infect Dis J.* 2018 Jan 15. PMID:29846357
- 342) Shivakoti R, Ewald ER, Gupte N, Yang WT, Kanyama C, Cardoso SW, Santos B, Supparatpinyo K, Badal-Faesen S, Lama JR, Lalloo U, Zulu F, Pawar JS, Riviere C, Kumarasamy N, Hakim J, Pollard R, Detrick B, Balagopal A, Asmuth DM, Semba RD, Campbell TB, Golub J, Gupta A; NWCS 319 and ACTG PEARLS Study Team. Effect of baseline micronutrient and inflammation status on CD4 recovery post-cART initiation in the multinational PEARLS trial. *Clin Nutr.* 2018 May 29. PMID:29885777
- 343) Peterson TE, Huppler Hullsiek K, Wyman Engen N, Kumarasamy N, Lebech AM, Liappis A, Papadopoulos A, Polizzotto MN, Schreiner PJ, Duprez D, Baker JV; INSIGHT START (Strategic Timing of AntiRetroviral Treatment) Study Group. Inflammation Associates With Impaired Small Arterial Elasticity Early in HIV Disease. *Open Forum Infect Dis.* 2018 May 19;5(6):PMID:29942822
- 344) Jiamsakul A, Kerr SJ, Kiertiburanakul S, Azwa I, Zhang F, Chaiwarith R, Wong W, Ly PS, Kumarasamy N, Ditangco R, Pujari S, Yunihastuti E, Do CD, Merati TP, Nguyen KV,

- Lee MP, Choi JY, Oka S, Kantipong P, Sim BLH, Ng OT, Ross J, Law M; TREAT Asia HIV Observational Database (TAHOD). Early suboptimal ART adherence was associated with missed clinical visits in HIV-infected patients in Asia. *AIDS Care*. 2018 Dec;30(12):1560-1566. PMID: 30021450
- 345) Barré-Sinoussi F, Abdool Karim SS, Albert J, Bekker LG, Beyrer C, Cahn P, Calmy A, Grinsztejn B, Grulich A, Kamarulzaman A, Kumarasamy N, Loutfy MR, El Filali KM, Mboup S, Montaner JS, Munderi P, Pokrovsky V, Vandamme AM, Young B, Godfrey-Faussett P. Expert consensus statement on the science of HIV in the context of criminal law. *J Int AIDS Soc*. 2018 Jul;21(7):e25161. PMID: 30044059
- 346) Swindells S, Gupta A, Kim S, Hughes MD, Sanchez J, Mave V, Dawson R, Kumarasamy N, Comins K, Smith B, Rustomjee R, Naini L, Shah NS, Hesselting A, Churchyard G. Resource utilization for multidrug-resistant tuberculosis household contact investigations (A5300/I2003). *Int J Tuberc Lung Dis*. 2018 Sep 1;22(9):1016-1022. PMID: 30092866
- 347) Robertson K, Oladeji B, Jiang H, Kumwenda J, Supparatpinyo K, Campbell T, Hakim J, Tripathy S, Hosseinipour M, Marra CM; 5199 study team, Kumarasamy N, Evans S, Vecchio A, La Rosa A, Santos B, Silva MT, Montano S, Kanyama C, Firnhaber C, Price R, Marcus C, Berzins B, Masih R, Laloo U, Sanne I, Yosief S, Walawander A, Nair A, Sacktor N, Hall C; AIDS Clinical Trials Group. HIV-1 and TB Co-infection in Multinational Resource Limited Settings: Increased neurological dysfunction. *Clin Infect Dis*. 2018 Aug 20. PMID: 30137250
- 348) Kumarasamy N, Prabhu S, Chandrasekaran E, Poongulali S, Pradeep A, Chitra D, Balakrishnan R, Benson CA. Safety, Tolerability, and Efficacy of Generic Dolutegravir-containing Antiretroviral Therapy Regimens Among South Indian Human Immunodeficiency Virus-infected Patients. *Clin Infect Dis*. 2019 Mar 5;68(6):1048-1051. PMID: 30192925
- 349) Robertson KR, Jiang H, Kumwenda J, Supparatpinyo K, Marra CM, Berzins B, Hakim J, Sacktor N, Campbell TB, Schouten J, Mollan K, Tripathy S, Kumarasamy N, La Rosa A, Santos B, Silva MT, Kanyama C, Firnhaber C, Murphy R, Hall C, Marcus C, Naini L, Masih R, Hosseinipour MC, Mngqibisa R, Badal-Faesens S, Yosief S, Vecchio A, Nair A; AIDS Clinical Trials Group. HIV Associated Neurocognitive Impairment in Diverse Resource Limited Settings. *Clin Infect Dis*. 2018 Sep 13. PMID: 30219843
- 350) Joshi K, Boettiger D, Kerr S, Nishijima T, Van Nguyen K, Ly PS, Lee MP, Kumarasamy N, Wong W, Kantipong P, Cuong DD, Kamarulzaman A, Choi JY, Zhang F, Chaiwarith R, Ng OT, Kiertiburanakul S, Sim BLH, Merati TP, Yunihastuti E, Ditangco R, Ross J, Pujari S. Changes in renal function with long-term exposure to antiretroviral therapy in HIV-infected adults in Asia. *Pharmacoepidemiol Drug Saf*. 2018 Nov;27(11):1209-1216. PMID: 30246898

- 351) Bartlett AW, Mohamed TJ, Sudjaritruk T, Kurniati N, Nallusamy R, Hansudewechakul R, Ly PS, Truong KH, Lumbiganon P, Puthanakit T, Chokephaibulkit K, Nguyen LV, Do VC, Kumarasamy N, Nik Yusoff NK, Fong MS, Wati DK, Sohn AH, Kariminia A; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. Disease- and Treatment-related Morbidity in Adolescents With Perinatal HIV Infection in Asia. *Pediatr Infect Dis J*. 2019 Mar;38(3):287-292. PMID: 30281549
- 352) Dharan NJ, Neuhaus J, Rockstroh JK, Peters L, Gordin F, Arenas-Pinto A, Emerson C, Marks K, Hidalgo J, Sarmiento-Castro R, Stephan C, Kumarasamy N, Emery S, Matthews GV; INSIGHT START Study Group. Benefit of Early versus Deferred Antiretroviral Therapy on Progression of Liver Fibrosis among People with HIV in the START Randomized Trial. *Hepatology*. 2019 Mar;69(3):1135-1150. PMID: 30298608
- 353) Pallikkuth S, Pahwa R, Kausalya B, Saravanan S, Pan L, Vignesh R, Iqbal S, Solomon SS, Murugavel KG, Poongulali S, Kumarasamy N, Pahwa S. Cardiac morbidity in HIV infection is associated with checkpoint inhibitor LAG-3 on CD4 T cells. *PLoS One*. 2018 Oct 31;13(10):e0206256. PMID: 30379878
- 354) Kumarasamy N, Poongulali S, Beulah FE, Akite EJ, Ayuk LN, Bollaerts A, Demoitié MA, Jongert E, Ofori-Anyinam O, Van Der Meeren O. Long-term safety and immunogenicity of the M72/AS01E candidate tuberculosis vaccine in HIV-positive and -negative Indian adults: Results from a phase II randomized controlled trial. *Medicine (Baltimore)*. 2018 Nov;97(45):e13120.PMID: 30407329
- 355) 351. Venter WDF, Kambugu A, Chersich MF, Becker S, Hill A, Arulappan N, Moorhouse M, Majam M, Akpomiemie G, Sokhela S, Poongulali S, Feldman C, Duncombe C, Brown Ripin DH, Kumarasamy N. Efficacy and safety of tenofovir disoproxil fumarate versus low-dose stavudine over 96 weeks: a multi-country randomised, non-inferiority trial. *J Acquir Immune Defic Syndr*. 2018 Nov 12. PMID: 30422900
- 356) Mu W, Bartlett AW, Bunupuradah T, Chokephaibulkit K, Kumarasamy N, Ly PS, Hansudewechakul R, Nguyen LV, Lumbiganon P, Sudjaritruk T, Mohamed TAJ, Yusoff NKN, Truong KH, Do VC, Fong MS, Nallusamy R, Kurniati N, Wati DK, Sohn AH, Kariminia A, Zhang F; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. Early and Late Virologic Failure After Virologic Suppression in HIV-Infected Asian Children and Adolescents. *J Acquir Immune Defic Syndr*. 2019 Mar 1;80(3):308-315.
- 357) Jiamsakul A, Polizzotto M, Wen-Wei Ku S, Tanuma J, Hui E, Chaiwarith R, Kiertiburanakul S, Avihingasanon A, Yuniastuti E, Kumarasamy N, Ly PS, Pujari S, Ditangco R, Do CD, Merati TP, Kantipong P, Zhang F, Van Nguyen K, Kamarulzaman A, Choi JY, Sim BLH, Ng OT, Ross J, Wong W. Brief Report: Malinancies in Adults

Living With HIV in Asia. *J Acquir Immune Defic Syndr*. 2019 Mar 1;80(3):301-307.
PMID: 30531303

- 358) Vos AG, Chersich MF, Klipstein-Grobusch K, Zuithoff P, Moorhouse MA, Lalla-Edward ST, Kambugu A, Kumarasamy N, Grobbee DE, Barth RE, Venter WD. Lipid levels, insulin resistance and cardiovascular risk over 96 weeks of antiretroviral therapy: a randomised controlled trial comparing low-dose stavudine and tenofovir. *Retrovirology*. 2018 Dec 14;15(1): PMID:30547820
- 359) Pasayan MKU, S Mationg ML, Boettiger D, Lam W, Zhang F, Ku SW, Merati TP, Chaiwarith R, Cuong DD, Yunihastuti E, Kiertiburanakul S, Van Kinh N, Avihingsanon A, Sun LP, Kamarulzaman A, Kantipong P, Kumarasamy N, Pujari S, Heng Sim BL, Ng OT, Choi JY, Tanuma J, Ross J, A Ditangco R. Effect of Macrolide Prophylactic Therapy on AIDS-Defining Conditions and HIV-Associated Mortality. *J Acquir Immune Defic Syndr*. 2019 Apr 1;80(4):436-443. PMID: 30550488
- 360) Rose R, Hall M, Redd AD, Lamers S, Barbier AE, Porcella SF, Hudelson SE, Piwowar-Manning E, McCauley M, Gamble T, Wilson EA, Kumwenda J, Hosseinipour MC, Hakim JG, Kumarasamy N, Chariyalertsak S, Pilotto JH, Grinsztejn B, Mills LA, Makhema J, Santos BR, Chen YQ, Quinn TC, Fraser C, Cohen MS, Eshleman SH, Laeyendecker O. Phylogenetic methods inconsistently predict direction of HIV transmission among heterosexual pairs in the HPTN052 cohort. *J Infect Dis*. 2018 Dec 24. PMID: 30590741
- 361) Opollo VS, Wu X, Hughes MD, Swindells S, Gupta A, Hesselning A, Churchyard G, Kim S, Lando R, Dawson R, Mave V, Mendoza A, Gonzales P, Kumarasamy N, von Groote-Bidlingmaier F, Conradie F, Shenje J, Fontain SN, Garcia-Prats A, Asmelash A, Nedswan S, Mohapi L, Mngqibisa R, Garcia Ferreira AC, Okeyo E, Naini L, Jones L, Smith B, Shah NS. HIV testing uptake among the household contacts of multidrug-resistant tuberculosis index cases in eight countries. *Int J Tuberc Lung Dis*. 2018 Dec 1;22(12):1443-1449. PMID: 30606316
- 362) Bijker R, Jiamsakul A, Uy E, Kumarasamy N, Ditango R, Chaiwarith R, Wong WW, Avihingsanon A, Sun LP, Yunihastuti E, Pujari S, Do CD, Merati TP, Kantipong P, Nguyen KV, Kamarulzaman A, Zhang F, Lee MP, Choi JY, Tanuma J, Ng OT, Sim B, Ross J, Kiertiburanakul S; TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Cardiovascular disease-related mortality and factors associated with cardiovascular events in the TREAT Asia HIV Observational Database (TAHOD). *HIV Med*. 2019 Mar;20(3):183-191. PMID: 30620108
- 363) Venter WDF, Kambugu A, Chersich MF, Becker S, Hill A, Arulappan N, Moorhouse M, Majam M, Akpomiemie G, Sokhela S, Poongulali S, Feldman C, Duncombe C, Ripin DHB, Vos A, Kumarasamy N. Efficacy and Safety of Tenofovir Disoproxil Fumarate Versus Low-Dose Stavudine Over 96 Weeks: A Multicountry Randomized,

Noninferiority Trial. *J Acquir Immune Defic Syndr*. 2019 Feb 1;80(2):224-233.
PMID:30640204

- 364) Han WM, Jiamsakul A, Kiertiburanakul S, Ng OT, Sim BL, Sun LP, Van Nguyen K, Choi JY, Lee MP, Wong WW, Kamarulzaman A, Kumarasamy N, Zhang F, Tanuma J, Do CD, Chaiwarith R, Merati TP, Yuniastuti E, Pujari S, Ditangco R, Khusuwan S, Ross J, Avihingsanon A; IeDEA Asia-Pacific. Diabetes mellitus burden among people living with HIV from the Asia-Pacific region. *J Int AIDS Soc*. 2019 Jan;22(1): PMID: 30697944
- 365) Chan BT, Pradeep A, Chandrasekaran E, Prasad L, Murugesan V, Kumarasamy N, Mayer KH, Tsai AC. Reliability, Validity, and Factor Structure of the Internalized AIDS-Related Stigma Scale in Southern India. *Int Assoc Provid AIDS Care*. 2019 Jan-Dec;18:2325958219831025. PMID: 30782053
- 366) Ahn MY, Jiamsakul A, Khusuwan S, Khol V, Pham TT, Chaiwarith R, Avihingsanon A, Kumarasamy N, Wong WW, Kiertiburanakul S, Pujari S, Nguyen KV, Lee MP, Kamarulzaman A, Zhang F, Ditangco R, Merati TP, Yuniastuti E, Ng OT, Sim BLH, Tanuma J, Ratanasuwan W, Ross J, Choi JY; IeDEA Asia-Pacific. The influence of age-associated comorbidities on responses to combination antiretroviral therapy in older people living with HIV. *J Int AIDS Soc*. 2019 Feb;22(2):e25228. doi: 10.1002/jia2.25228. PMID: 30803162
- 367) Bijker R, Kumarasamy N, Kiertiburanakul S, Pujari S, Lam W, Chaiwarith R, Wong WW, A, Kantipong P, Avihingsanon A, Nguyen KV, Tanuma J, Ng OT, Sim BL, Merati TP, Choi JY, Ditangco R, Yuniastuti E, Sun LP, Do CD, Ross J, Law M; TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Cardiovascular disease incidence projections in the TREAT Asia HIV Observational Database (TAHOD). *Antivir Ther*. 2019 Mar 5. PMID:30833516
- 368) Suryavanshi N, Murrill M, Gupta A, Hughes M, Hesselning A, Kim S, Naini L, Jones L, Smith B, Gupte N, Dawson R, Mave V, Meshram S, Mendoza-Ticona A, Sanchez J, Kumarasamy N, Comins K, Conradie F, Shenje J, Nerette Fontain S, Garcia-Prats A, Asmelash A, Nedsuwan S, Mohapi L, Lalloo U, Ferreira ACG, Okeyo E, Swindells S, Churchyard G, Shah NS; A5300/I2003 Study Team. Willingness to Take Multidrug-Resistant Tuberculosis (MDR-TB) Preventive Therapy among Adult and Adolescent Household Contacts of MDR-TB Index Cases: An International Multi-Site Cross-Sectional Study. *Clin Infect Dis*. 2019 Mar 28. PMID:30919881
- 369) Kazemian P, Costantini S, Kumarasamy N, Paltiel AD, Mayer KH, Chandhiok N, Walensky RP, Freedberg KA. The Cost-effectiveness of HIV Pre-exposure Prophylaxis and HIV Testing Strategies in High-risk Groups in India. *Clin Infect Dis*. 2019 Mar 28. PMID:30921454

- 370) Ku SW, Jiamsakul A, Joshi K, Pasayan MKU, Widhani A, Chaiwarith R, Kiertiburanakul S, Avihingsanon A, Ly PS, Kumarasamy N, Do CD, Merati TP, Nguyen KV, Kamarulzaman A, Zhang F, Lee MP, Choi JY, Tanuma J, Khusuwan S, Sim BLH, Ng OT, Ratanasuwan W, Ross J, Wong WW; TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Cotrimoxazole prophylaxis decreases tuberculosis risk among Asian patients with HIV. *J Int AIDS Soc.* 2019 Mar;22(3):e25264. PMID:30924281
- 371) Gupta A, Swindells S, Kim S, Hughes MD, Naini L, Wu X, Dawson R, Mave V, Sanchez J, Mendoza A, Gonzales P, Kumarasamy N, Comins K, Conradie F, Shenje J, Fontain SN, Garcia-Prats A, Asmelash A, Nedsuwan S, Mohapi L, Laloo UG, Ferreira ACG, Mugah C, Harrington M, Jones L, Cox S, Smith B, Shah NS, Hesseling AC, Churchyard G; ACTG 5300/IMPAACT I2003 PHOENIX Feasibility study team. Feasibility of Identifying Household Contacts of Rifampin- and Multidrug-Resistant Tuberculosis Cases at High Risk of Progression to Tuberculosis Disease. *Clin Infect Dis.* 2019 Mar 28. PMID:30942853
- 372) Jiamsakul A, Kiertiburanakul S, Ng OT, Chaiwarith R, Wong W, Ditangco R, Nguyen KV, Avihingsanon A, Pujari S, Do CD, Lee MP, Ly PS, Yuniastuti E, Kumarasamy N, Kamarulzaman A, Tanuma J, Zhang F, Choi JY, Kantipong P, Sim B, Ross J, Law M, Merati TP; TREAT Asia HIV Observational Database of IeDEA Asia-Pacific. Long-term loss to follow-up in the TREAT Asia HIV Observational Database (TAHOD). *HIV Med.* 2019 Apr 12. doi: 10.1111/hiv.12734. PMID: 30980495
- 373) Grinsztejn B, Hughes MD, Ritz J, Salata R, Mugenyi P, Hogg E, Wieclaw L, Gross R, Godfrey C, Cardoso SW, Bukuru A, Makanga M, Faesen S, Mave V, Wangari Ndege B, Nerette Fontain S, Samaneka W, Secours R, van Schalkwyk M, Mngqibisa R, Mohapi L, Valencia J, Sugandhavesa P, Montalban E, Avihingsanon A, Santos BR, Kumarasamy N, Kanyama C, Schooley RT, Mellors JW, Wallis CL, Collier AC; A5288 Team. [Third-line antiretroviral therapy in low-income and middle-income countries \(ACTG A5288\): a prospective strategy study.](#) *Lancet HIV.* 2019 Sep;6(9):e588-e600. doi: 10.1016/S2352-3018(19)30146-8. PMID:31371262
- 374) Bartlett AW, Lumbiganon P, Kurniati N, Sudjaritruk T, Mohamed TJ, Hansudewechakul R, Ly PS, Truong KH, Puthanakit T, Nguyen LV, Chokephaibulkit K, Do VC, Kumarasamy N, Nik Yusoff NK, Fong MS, Watu DK, Nallusamy R, Sohn AH, Law MG; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. [Use and Outcomes of Antiretroviral Monotherapy and Treatment Interruption in Adolescents With Perinatal HIV Infection in Asia.](#) *J Adolesc Health.* 2019 Nov;65(5):651-659. doi: 10.1016/j.jadohealth.2019.05.025. Epub 2019 Aug 5. PMID:31395514
- 375) Sinha N, Yang A, Pradeep A, Bhuvanewari R, Kumarasamy N, O'Clairigh C, Mayer KH, Chan BT. [Feasibility and acceptability of a psychosocial and adherence electronic patient reported outcomes \(PROs\) system at](#)

- [an HIV care center in southern India](#). AIDS Care. 2019 Sep 18:1-7. doi: 10.1080/09540121.2019.1668532.
PMID: 31533448
- 376) Brazier E, Maruri F, Duda SN, Tymejczyk O, Wester CW, Somi G, Ross J, Freeman A, Cornell M, Poda A, Musick BS, Zhang F, Althoff KN, Mugglin C, Kimmel AD, Yotebieng M, Nash D; IeDEA Consortium. [Implementation of "Treat-all" at adult HIV care and treatment sites in the Global IeDEA Consortium: results from the Site Assessment Survey](#). J Int AIDS Soc. 2019 Jul;22(7):e25331. doi: 10.1002/jia2.25331. PMID:31623428
- 377) Vecchio AC, Marra CM, Schouten J, Jiang H, Kumwenda J, Supparatpinyo K, Hakim J, Sacktor N, Campbell TB, Tripathy S, Kumarasamy N, La Rosa A, Santos B, Silva MT, Kanyama C, Firnhaber C, Hosseinipour MC, Mngqibisa R, Hall C, Cinque P, Robertson K. [Distal Sensory Peripheral Neuropathy in Human Immunodeficiency Virus Type 1-Positive Individuals Before and After Antiretroviral Therapy Initiation in Diverse Resource-Limited Settings](#). Clin Infect Dis. 2019 Aug 12. pii: ciz745. doi: 10.1093/cid/ciz745. PMID:31630166
- 378) Bartlett AW, Lumbiganon P, Jamal Mohamed TA, Lapphra K, Muktiarti D, Du QT, Hansudewechakul R, Ly PS, Truong KH, Van Nguyen L, Puthanakit T, Sudjaritruk T, Chokephaibulkit K, Do VC, **Kumarasamy N**, Nik Yusoff NK, Kurniati N, Fong MS, Wati DK, Nallusamy R, Sohn AH, Kariminia A; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. Dual Analysis of Loss to Follow-up for Perinatally **HIV**-Infected Adolescents Receiving Combination Antiretroviral Therapy in Asia. J Acquir Immune Defic Syndr. 2019 Dec 15;82(5):431-438. doi: 10.1097/QAI.0000000000002184. PMID:31714422
- 379) Rupasinghe D, Kiertiburanakul S, Kamarulzaman A, Zhang F, **Kumarasamy N**, Chaiwarith R, Merati TP, Do CD, Khusuwan S, Avihingsanon A, Lee MP, Ly PS, Yunihastuti E, Nguyen KV, Ditangco R, Chan YJ, Pujari S, Ng OT, Choi JY, Sim B, Tanuma J, Sangle S, Ross J, Law M. Early mortality after late initiation of antiretroviral therapy in the TREAT Asia HIV Observational Database (TAHOD) of the International Epidemiologic Databases to Evaluate AIDS (IeDEA) Asia-Pacific. **HIV Med**. 2019 Dec 18. PMID: 31852025
- 380) Zhang Y, Wymant C, Laeyendecker O, Grabowski MK, Hall M, Hudelson S, Piwowar-Manning E, McCauley M, Gamble T, Hosseinipour MC, **Kumarasamy N**, Hakim JG, Kumwenda J, Mills LA, Santos BR, Grinsztejn B, Pilotto JH, Chariyalertsak S, Makhema J, Chen YQ, Cohen MS, Fraser C, Eshleman SH. Evaluation of phylogenetic methods for inferring the direction of **HIV** transmission: HPTN 052. Clin Infect Dis. 2020 Jan 10. PMID: 31922537

- 381) Colocci I, Perlo J, Rajagopal SS, Betancourt TS, Pradeep A, Mayer KH, **Kumarasamy N**, O'Cleirigh C, Katz IT, Chan BT. Economic vulnerability and non-initiation of antiretroviral therapy in India: a qualitative study. *AIDS Care*. 2020 Jan 13;1-5. PMID: 31928214
- 382) Boettiger DC, Law MG, Ross J, Huy BV, Heng B, Ditangco R, Kiertiburanakul S, Avihingsanon A, Cuong DD, **Kumarasamy N**, Kamarulzaman A, Ly PS, Yuniastuti E, Parwati Merati T, Zhang F, Khusuwan S, Chaiwarith R, Lee MP, Sangle S, Choi JY, Ku WW, Tanuma J, Ng OT, Sohn AH, Wester CW, Nash D, Mugglin C, Pujari S. Atherosclerotic cardiovascular disease screening and management protocols among adult HIV clinics in Asia. *J Virus Erad*. 2020 Feb 20;6(1):11-18. PMID: 32175086
- 383) LaVergne S, Umlauf A, McCutchan A, Heaton R, Benson C, **Kumarasamy N**, Bharti AR. Impact of Latent Tuberculosis Infection on Neurocognitive Functioning and Inflammation in HIV-Infected and Uninfected South Indians. *J Acquir Immune Defic Syndr*. 2020 Apr 9. PMID:32282443
- 384) Bijker R, Kiertiburanakul S, **Kumarasamy N**, Pujari S, Sun LP, Ng OT, Lee MP, Choi JY, Nguyen KV, Chan YJ, Merati TP, Cuong DD, Ross J, Jiamsakul A; IeDEA Asia-Pacific. Survival after long-term ART exposure: findings from an Asian patient population retained in care beyond 5 years on ART. *Antivir Ther*. 2020 May 5;10.3851/IMP3358. PMID: 32369040
- 385) Sohn AH, Lumbiganon P, Kurniati N, Lapphra K, Law M, Do VC, Van Nguyen L, Truong KH, Wati DK, Ounchanum P, Puthanakit T, Sudjaritruk T, Ly PS, Yusoff NKN, Fong SM, Mohamed TJ, Nallusamy R, **Kumarasamy N**, Kariminia A; for IeDEA Asia-Pacific. Determining standardized causes of death of infants, children, and adolescents living with HIV in Asia. *AIDS*. 2020 Aug 1;34(10):1527-1537. PMID: 32443064
- 386) Jesson J, Desmonde S, Yiannoutsos CT, Patten G, Malateste K, Duda SN, **Kumarasamy N**, Yotebieng M, Davies MA, Musick B, Leroy V, Ciaranello A; IeDEA. Weight-for-age distributions among children with HIV on antiretroviral therapy in the International epidemiology Databases to Evaluate AIDS (IeDEA) multiregional consortium. *BMC Res Notes*. 2020 May 24;13(1):249. PMID: 32448379
- 387) Perlo J, Colocci I, Rajagopal SS, Betancourt TS, Pradeep A, Mayer KH, **Kumarasamy N**, O'Cleirigh C, Chan BT. The Convergence of Disclosure Concerns and Poverty Contributes to Loss to HIV Care in India: A Qualitative Study. *J Int Assoc Provid AIDS Care*. 2020 Jan-

Dec;19:2325958220934606. PMID: 32573330

- 388) Bartlett AW, Sudjaritruk T, Mohamed TJ, Anugulruengkitt S, **Kumarasamy N**, Phongsamart W, Ly PS, Truong KH, Nguyen LV, Do VC, Ounchanum P, Puthanakit T, Chokeyphaibulkit K, Lumbiganon P, Kurniati N, Yusoff NKN, Wati DK, Sohn AH, Kariminia A; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. Identification, management and outcomes of combination antiretroviral treatment failure in adolescents with perinatal HIV infection in Asia. *Clin Infect Dis*. 2020 Jun 26;ciaa872. PMID: 32589711
- 389) Sudjaritruk T, Teeraananchai S, Kariminia A, Lapphra K, **Kumarasamy N**, Fong MS, Hansudewechakul R, Bunupuradah T, Ly PS, Nallusamy RA, Sohn AH, Sirisanthana V; TREAT Asia Pediatric HIV Observational Database of IeDEA Asia-Pacific. Impact of low-level viraemia on virological failure among Asian children with perinatally acquired HIV on first-line combination antiretroviral treatment: a multicentre, retrospective cohort study. *J Int AIDS Soc*. 2020 Jul;23(7):e25550. PMID: 32628816
- 390) Folschweiller N, Teixeira J, Joshi S, Goldani LZ, Supparatpinyo K, Basu P, Chotpitayasunondh T, Chetchotisakd P, Ruxrungtham K, Roteli-Martins C, Grinsztejn B, Quintana SM, **Kumarasamy N**, Poongulali S, Kulkarni V, Lin L, Datta SK, Descamps D, Dodet M, Dubin G, Friel D, Hezareh M, Karkada N, Meric Camilleri D, Poncelet S, Salaun B, Tavares-da-Silva F, Thomas-Jooris F, Struyf F. Immunogenicity and safety of the AS04-HPV-16/18 and HPV-6/11/16/18 human papillomavirus vaccines in asymptomatic young women living with HIV aged 15-25 years: A phase IV randomized comparative study. *EClinicalMedicine*. 2020 May 25;23:100353. PMID: 32639485
- 391) Fichtenbaum CJ, Ribaldo HJ, Leon-Cruz J, Overton ET, Zanni MV, Malvestutto CD, Aberg JA, Kileel EM, Fitch KV, Van Schalkwyk M, **Kumarasamy N**, Martinez E, Santos BR, Joseph Y, Lo J, Siminski S, Melbourne K, Sponseller CA, Desvigne-Nickens P, Bloomfield GS, Currier JS, Hoffmann U, Douglas PS, Grinspoon SK; REPRIEVE Investigators. Patterns of Antiretroviral Therapy Use and Immunologic Profiles at Enrollment in the REPRIEVE Trial. *J Infect Dis*. 2020 Jul 9;222(Suppl 1):S8-S19. PMID: 32645162
- 392) Sudharshan S, Menia NK, Selvamuthu P, Tyagi M, **Kumarasamy N**, Biswas J. Ocular syphilis in patients with human immunodeficiency virus/acquired immunodeficiency syndrome in the era of highly active antiretroviral therapy. *Indian J Ophthalmol*. 2020 Sep;68(9):1887-1893. PMID: 32823409
- 393) Fichtenbaum CJ, Ribaldo HJ, Leon-Cruz J, Overton ET, Zanni MV, Malvestutto CD, Aberg JA, Kileel EM, Fitch KV, Van Schalkwyk M, **Kumarasamy N**, Martinez E, Santos BR, Joseph Y, Lo J, Siminski S, Melbourne K, Sponseller CA, Desvigne-Nickens P,

- Bloomfield GS, Currier JS, Hoffmann U, Douglas PS, Grinspoon SK; REPRIEVE Investigators. Corrigendum to: Patterns of Antiretroviral Therapy Use and Immunologic Profiles at Enrollment in the REPRIEVE Trial. *J Infect Dis.* 2020 Oct 17;jiaa594. doi: 10.1093/infdis/jiaa594. PMID: 33068427
- 394) Prabhu S, Poongulali S, **Kumarasamy N**. Impact of COVID-19 on people living with HIV: A review. *J Virus Erad.* 2020 Nov;6(4):100019. doi: 10.1016/j.jve.2020.100019. Epub 2020 Oct 15. PMID: 33083001
- 395) Ross J, Jiamsakul A, **Kumarasamy N**, Azwa I, Merati TP, Do CD, Lee MP, Ly PS, Yunihastuti E, Nguyen KV, Ditangco R, Ng OT, Choi JY, Oka S, Sohn AH, Law M. Virological failure and HIV drug resistance among adults living with HIV on second-line antiretroviral therapy in the Asia-Pacific. *HIV Med.* 2020 Nov 5. doi: 10.1111/hiv.13006. PMID: 33151020
- 396) Han WM, Jiamsakul A, Jantarapakde J, Yunihastuti E, Choi JY, Ditangco R, Chaiwarith R, Sun LP, Khusuwan S, Merati TP, Do CD, Azwa I, Lee MP, Van Nguyen K, Chan YJ, Kiertiburanakul S, Ng OT, Tanuma J, Pujari S, Zhang F, Gani YM, Sangle S, Ross J, **Kumarasamy N**; the TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Association of body mass index with immune recovery, virological failure and cardiovascular disease risk among people living with HIV. *HIV Med.* 2020 Nov 17. doi: 10.1111/hiv.13017. PMID: 33200864
- 397) Repurposed Antiviral Drugs for Covid-19 - Interim WHO Solidarity Trial Results. WHO Solidarity Trial Consortium, *N Engl J Med.* 2021 Feb 11;384(6):497-511. PMID: 33264556
- 398) Henry RT, Jiamsakul A, Law M, Losso M, Kamarulzaman A, Phanuphak P, **Kumarasamy N**, Foulkes S, Mohapi L, Nwizu C, Wood R, Kelleher A, Polizzotto M; SECOND-LINE Study Group. Factors Associated With and Characteristic of HIV/Tuberculosis Co-Infection: A Retrospective Analysis of SECOND-LINE Clinical Trial Participants. *J Acquir Immune Defic Syndr.* 2021 May 1;87(1):720-729. PMID: 33399309
- 399) Bijker R, **Kumarasamy N**, Kiertiburanakul S, Pujari S, Ng OT, Sun LP, Merati TP, Van Nguyen K, Lee MP, Cuong DD, Chan YJ, Choi JY, Ross J, Law M; IeDEA Asia-Pacific. An expanded HIV care cascade: ART uptake, viral load suppression and comorbidity monitoring among adults living with HIV in Asia. *Antivir Ther.* 2020;25(5):275-285. PMID: 33464222
- 400) Kannian P, Lavanya C, Ravichandran K, Bagavad Gita J, Mahanathi P, Ashwini V, **Kumarasamy N**, Rajan G, Ranganathan K, Challacombe SJ, Webster-Cyriaque J, Johnson NW. SARS-CoV2 antigen in whole mouth fluid may be a reliable rapid detection tool. *Oral Dis.* 2021 Feb 3;10.1111/odi.13793. doi: 10.1111/odi.13793. PMID: 33534926
- 401) Palefsky JM, Poongulali S, Lensing S, Lee J, Da Costa M, Chein A, Beulah F,

- Murugavel KG, **Kumarasamy N**. AIDS Malignancy Consortium 054: Safety and Immunogenicity of the Quadrivalent Vaccine in Indian Women Living With HIV. *J Acquir Immune Defic Syndr*. 2021 Jun 1;87(2):875-881. PMID: 33587509
- 402) Apornpong T, Grinsztejn B, Hughes M, Ritz J, Kerr SJ, Fletcher CV, Ruxrungtham K, Godfrey C, Gross R, Hogg E, Wallis CL, Badal-Faesen S, Hosseinipour MC, Mngqobisa R, Santos BR, Shah S, Hovind LJ, Mawlana S, Van Schalkwyk M, Chotirosniramit N, Kanyama C, **Kumarasamy N**, Salata R, Collier AC, Gandhi M; for A5288 study team. Antiretroviral hair levels, self-reported adherence, and virologic failure in second-line regimen patients in resource-limited settings. *AIDS*. 2021 Jul 15;35(9):1439-1449. PMID: 33831905
- 403) Jiamsakul A, Azwa I, Zhang F, Yuniastuti E, Ditangco R, **Kumarasamy N**, Ng OT, Chan YJ, Ly PS, Choi JY, Lee MP, Pujari S, Kiertiburanakul S, Chaiwarith R, Merati TP, Sangle S, Khusuwan S, Sim BL, Avihingsanon A, Duy C, Tanuma J, Ross J, Law M, Asia-Pacific TAHODOITreatment modification after second-line failure among people living with HIV in the Asia-Pacific. *Antivir Ther*. 2020;25(7):377-387.PMID: 33843656
- 404) Kannian P, Jayaraman BG, Alamelu S, Lavanya C, **Kumarasamy N**, Rajan G, Ranganathan K, Mahanathi P, Ashwini V, Challacombe SJ, Webster-Cyriaque J, Johnson NW Implications in the quantification of SARS-CoV2 copies in concurrent nasopharyngeal swabs, whole mouth fluid and respiratory droplets. *Virus Res*. 2021 Oct 2;303:198442. PMID: 33940004
- 405) Jiamsakul A, Boyd M, Choi JY, Edmiston N, **Kumarasamy N**, Hutchinson J, Law M, Ditangco R; TREAT Asia HIV Observational Database (TAHOD) and the Australian HIV Observational Database (AHOD) of IeDEA Asia-Pacific. Trends in Follow-Up Visits Among People Living With HIV: Results From the TREAT Asia and Australian HIV Observational Databases. *J Acquir Immune Defic Syndr*. 2021 Sep 1;88(1):70-78.PMID: 33990493
- 406) Han WM, Jiamsakul A, Salleh NAM, Choi JY, Huy BV, Yuniastuti E, Do CD, Merati TP, Gani YM, Kiertiburanakul S, Zhang F, Chan YJ, Lee MP, Chaiwarith R, Ng OT, Khusuwan S, Ditangco R, **Kumarasamy N**, Sangle S, Ross J, Avihingsanon A; TREAT Asia HIV Observational Database (TAHOD) of the International Epidemiology Databases to Evaluate AIDS (IeDEA) Asia-Pacific Group. HIV treatment outcomes among people who acquired HIV via injecting drug use in the Asia-Pacific region: a longitudinal cohort study. *J Int AIDS Soc*. 2021 May;24(5):e25736. PMID: 34021711
- 407) Gatechompol S, Zheng L, Bao Y, Avihingsanon A, Kerr SJ, **Kumarasamy N**, Hakim JG, Maldarelli F, Gorelick RJ, Welker JL, Lifson JD, Hosseinipour MC, Eron JJ, Ruxrungtham K. Prevalence and risk of residual viremia after ART in low- and middle-income countries: A cross-sectional study. *Medicine (Baltimore)*. 2021 Sep 3;100(35):e26817. doi: 10.1097/MD.00000000000026817. PMID: 34477118; PMCID: PMC8415996.
- 408) Han WM, Law MG, Choi JY, Ditangco R, **Kumarasamy N**, Chaiwarith R, Ly PS, Khusuwan S, Merati TP, Do CD, Yuniastuti E, Azwa I, Lee MP, Pham TN, Chan YJ, Kiertiburanakul S, Ng OT, Tanuma J, Pujari S, Zhang F, Gani Y, Mave V, Ross J, Avihingsanon A; TREAT Asia HIV Observational Database of IeDEA Asia-Pacific. Weight changes, metabolic syndrome and all-cause mortality among Asian adults living with HIV. *HIV Med*. 2022 Mar;23(3):274-286. doi: 10.1111/hiv.13211. Epub 2021 Nov 23. PMID: 34816562; PMCID: PMC8847330.

- 409) Romo ML, Patel RC, Edwards JK, Humphrey JM, Musick BS, Bernard C, Maina MW, Brazier E, Castelnovo B, Penner J, Wyka K, Cardoso SW, Ly PS, Kunzekwenyika C, Cortés CP, Panczak R, Kelvin EA, Wools-Kaloustian KK, Nash D; International epidemiology Databases to Evaluate AIDS (IeDEA). Disparities in Dolutegravir Uptake Affecting Females of Reproductive Age With HIV in Low- and Middle-Income Countries After Initial Concerns About Teratogenicity : An Observational Study. *Ann Intern Med.* 2022 Jan;175(1):84-94. doi: 10.7326/M21-3037. Epub 2021 Nov 30. PMID: 34843382; PMCID: PMC8808594.
- 410) Han WM, Law MG, Egger M, Wools-Kaloustian K, Moore R, McGowan C, **Kumarasamy N**, Desmonde S, Edmonds A, Davies MA, Yiannoutsos C, Althoff KN, Cortes CP, Mohamed TJ, Jaquet A, Anastos K, Euvrard J, Castelnovo B, Salters K, Coelho LE, Ekouevi DK, Eley B, Diero L, Zaniewski E, Ford N, Sohn AH, Kariminia A; IeDEA collaboration. Global estimates of viral suppression in children and adolescents and adults on antiretroviral therapy adjusted for missing viral load measurements: a multiregional, retrospective cohort study in 31 countries. *Lancet HIV.* 2021 Dec;8(12):e766-e775. doi: 10.1016/S2352-3018(21)00265-4. PMID: 34856180; PMCID: PMC8782625.
- 411) Boettiger DC, An VT, **Kumarasamy N**, Azwa I, Sudjaritruk T, Truong KH, Avihingsanon A, Ross J, Kariminia A; International Epidemiology Databases to Evaluate AIDS—Asia-Pacific. Recent Trends in Adult and Pediatric Antiretroviral Therapy Monitoring and Failure. *J Acquir Immune Defic Syndr.* 2022 Jun 1;90(2):193-200. doi: 10.1097/QAI.0000000000002931. PMID: 35125475; PMCID: PMC9203901.
- 412) Boettiger DC, An VT, Lumbiganon P, Wittawatmongkol O, Huu Truong K, Chau Do V, Van Nguyen L, Sun Ly P, Kinikar A, Ounchanum P, Puthanakit T, Kurniati N, **Kumarasamy N**, Kumara Wati D, Chokephaibulkit K, Jamal Mohamed TA, Sudjaritruk T, Nik Yusoff NK, Siew Fong M, Nallusamy RA, Kariminia A; TREAT Asia Pediatric HIV Observational Database. Severe Recurrent Bacterial Pneumonia Among Children Living With HIV. *Pediatr Infect Dis J.* 2022 May 1;41(5):e208-e215. doi: 10.1097/INF.0000000000003494. PMID: 35185140.
- 413) Rupasinghe D, Choi JY, **Kumarasamy N**, Pujari S, Sun LP, Merati TP, Lee MP, Kinh NV, Kiertiburanakul S, Do CD, Avihingsanon A, Ross J, Jiamsakul A; IeDEA Asia-Pacific. Viral hepatitis and the cascade of care among people living with HIV in the Asia-Pacific. *HIV Med.* 2022 Oct;23(9):959-968. doi: 10.1111/hiv.13280. Epub 2022 Feb 25. PMID: 35218151; PMCID: PMC9402797.
- 414) Chakaya J, Petersen E, Nantanda R, Mungai BN, Migliori GB, Amanullah F, Lungu P, Ntoumi F, **Kumarasamy N**, Maeurer M, Zumla A. The WHO Global Tuberculosis 2021 Report - not so good news and turning the tide back to End TB. *Int J Infect Dis.* 2022 Nov;124 Suppl 1:S26-S29. doi: 10.1016/j.ijid.2022.03.011. Epub 2022 Mar 20. PMID: 35321845; PMCID: PMC8934249.
- 415) Kim JH, Jiamsakul A, Kiertiburanakul S, Huy BV, Khusuwan S, **Kumarasamy N**, Ng OT, Ly PS, Lee MP, Chan YJ, Gani YM, Azwa I, Avihingsanon A, Merati TP, Pujari S, Chaiwarith R, Zhang F, Tanuma J, Do CD, Ditangco R, Yuniastuti E, Ross J, Choi JY; IeDEA Asia-Pacific. Patterns and prognosis of holding regimens for people living with HIV in Asian countries. *PLoS One.* 2022 Mar 30;17(3):e0264157. doi: 10.1371/journal.pone.0264157. PMID: 35353840; PMCID: PMC8967045.
- 416) Kazemian P, Ding DD, Scott JA, Feser MK, Biello K, Thomas BE, Dange A, Bedoya CA, Balu V, Rawat S, **Kumarasamy N**, Mimiaga MJ, O'Cleirigh C, Weinstein MC, Kumar JP, Kumar S, Mayer KH, Safren SA, Freedberg KA. The cost-effectiveness of a resilience-based psychosocial intervention for HIV prevention among MSM in India.

AIDS. 2022 Jul 15;36(9):1223-1232. doi: 10.1097/QAD.0000000000003231. Epub 2022 Apr 26. PMID: 35471644; PMCID: PMC9283429.

- 417) Kausalya B, Saravanan S, Pallikkuth S, Pahwa R, Saini SR, Iqbal S, Solomon S, Murugavel KG, Poongulali S, **Kumarasamy N**, Pahwa S. Immune correlates of cardiovascular co-morbidity in HIV infected participants from South India. *BMC Immunol.* 2022 May 17;23(1):24. doi: 10.1186/s12865-022-00498-0. PMID: 35581554; PMCID: PMC9115939.
- 418) Khuon D, Rupasinghe D, Saphonn V, Kwong TS, Widhani A, Chaiwarith R, Ly PS, Do CD, Avihingsanon A, Khusuwan S, Merati TP, Van Nguyen K, **Kumarasamy N**, Chan YJ, Azwa I, Ng OT, Kiertiburanakul S, Tanuma J, Pujari S, Ditangco R, Zhang F, Choi JY, Gani Y, Sangle S, Ross J, Gorbach PM, Jiamsakul A; IeDEA Asia-Pacific. BMI as a predictor of high fasting blood glucose among people living with HIV in the Asia-Pacific region. *HIV Med.* 2023 Feb;24(2):139-152. doi: 10.1111/hiv.13351. Epub 2022 Jun 24. PMID: 35748404; PMCID: PMC9789206.
- 419) Singh JA, Moodley D, Little M, Luna F, Littler K, **Kumarasamy N**. The ethics of exclusion: why pregnant and lactating women must be front and centre of HIV research. *J Int AIDS Soc.* 2022 Jul;25 Suppl 2(Suppl 2):e25926. doi: 10.1002/jia2.25926. PMID: 35851759; PMCID: PMC9294868.
- 420) Rupasinghe D, Choi JY, Yunihastuti E, Kiertiburanakul S, Ross J, Ly PS, Chaiwarith R, Do CD, Chan YJ, **Kumarasamy N**, Avihingsanon A, Kamarulzaman A, Khusuwan S, Zhang F, Lee MP, Van Nguyen K, Merati TP, Sangle S, Oon Tek N, Tanuma J, Ditangco R, Sim BLH, Pujari S, Jiamsakul A; TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Factors associated with high alanine aminotransferase (ALT) and cirrhosis in people living with HIV on combination antiretroviral treatment (cART) in the Asia-Pacific. *J Med Virol.* 2022 Nov;94(11):5451-5464. doi: 10.1002/jmv.28019. Epub 2022 Aug 15. PMID: 35869413; PMCID: PMC9534455.
- 421) Fitch KV, McCallum SA, Erlandson KM, Overton ET, Zanni MV, Fichtenbaum C, Aberg JA, Fulda ES, Kileel EM, Moran LE, Bloomfield GS, Novak RM, Pérez-Frontera S, Abrams-Downey A, Pierone G Jr, **Kumarasamy N**, Ruxrungtham K, Mngqibisa R, Douglas PS, Ribaud HJ, Grinspoon SK. Diet in a global cohort of adults with HIV at low-to-moderate traditional cardiovascular disease risk. *AIDS.* 2022 Nov 15;36(14):1997-2003. doi: 10.1097/QAD.0000000000003344. Epub 2022 Jul 27. PMID: 35876637; PMCID: PMC9612704.
- 422) Papot E, Jacoby S, Arlinda D, Avihingsanon A, Azwa I, Borok M, Brown D, Cissé M, Dao S, Eriobu N, Kaplan R, Karyana M, **Kumarasamy N**, Lee J, Losso MH, Matthews GV, Perelis L, Perez-Casas C, Ruxrungtham K, Watkins M, Lane HC, Kelleher A, Law M, Polizzotto MN; D2EFT Study Group. Adaption of an ongoing clinical trial to quickly respond to gaps in changing international recommendations: the experience of D²EFT. *HIV Res Clin Pract.* 2022 Jul 19;23(1):37-46. PMID: 35938597; PMCID: PMC10029359.
- 423) ACTIV-3/TICO Study Group; Efficacy and Safety of Ensovibep for Adults Hospitalized With COVID-19 : A Randomized Controlled Trial. *Ann Intern Med.* 2022 Sep;175(9):1266-1274. doi: 10.7326/M22-1503. Epub 2022 Aug 9. PMID: 35939810; PMCID: PMC9384272.
- 424) Duraikkannu D, Akbar AB, Sudharshan S, Poongulali S, **Kumarasamy N**, Jayavelu T, Chatterjee N. Differential Expression of miRNA-192 is a Potential Biomarker for HIV Associated Immune Recovery Uveitis. *Ocul Immunol Inflamm.* 2022 Aug 10:1-10. doi:

10.1080/09273948.2022.2106247. Epub ahead of print. PMID: 35947816.

- 425) Teeraananchai S, Law M, Boettiger D, Mata N, Gupte N, Chan YL, Pham TN, Chaiwarith R, Ly PS, Chan YJ, Kiertiburanakul S, Khusuwan S, Zhang F, Yuniastuti E, **Kumarasamy N**, Pujari S, Azwa I, Somia IKA, Tanuma J, Ditangco R, Choi JY, Ng OT, Do CD, Gani Y, Ross J, Jiamsakul A; TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific. Virological failure and treatment switch after ART initiation among people living with HIV with and without routine viral load monitoring in Asia. *J Int AIDS Soc.* 2022 Aug;25(8):e25989. doi: 10.1002/jia2.25989. PMID: 36028921; PMCID: PMC9418417.
- 426) ACTIV-3/TICO Study Group; The Association of Baseline Plasma SARS-CoV-2 Nucleocapsid Antigen Level and Outcomes in Patients Hospitalized With COVID-19. *Ann Intern Med.* 2022 Oct;175(10):1401-1410. doi: 10.7326/M22-0924. Epub 2022 Aug 30. PMID: 36037469; PMCID: PMC9447373.
- 427) Avihingsanon A, Hughes MD, Salata R, Godfrey C, McCarthy C, Mugenyi P, Hogg E, Gross R, Cardoso SW, Bukuru A, Makanga M, Badal-Aesen S, Mave V, Ndege BW, Fontain SN, Samaneka W, Secours R, Van Schalkwyk M, Mngqibisa R, Mohapi L, Valencia J, Sugandhavesa P, Montalban E, Munyanga C, Chagomerana M, Santos BR, **Kumarasamy N**, Kanyama C, Schooley RT, Mellors JW, Wallis CL, Collier AC, Grinsztejn B; A5288 Study team. Third-line antiretroviral therapy, including raltegravir (RAL), darunavir (DRV/r) and/or etravirine (ETR), is well tolerated and achieves durable virologic suppression over 144 weeks in resource-limited settings: ACTG A5288 strategy trial. *J Int AIDS Soc.* 2022 Jun;25(6):e25905. doi: 10.1002/jia2.25905. PMID: 36039892; PMCID: PMC9332128.
- 428) Brazier E, Ajeh R, Maruri F, Musick B, Freeman A, Wester CW, Lee MP, Shamu T, Crabtree Ramirez B, d'Almeida M, Wools-Kaloustian K, **Kumarasamy N**, Althoff KN, Twizere C, Grinsztejn B, Tanser F, Messou E, Byakwaga H, Duda SN, Nash D; International epidemiology Databases to Evaluate AIDS. Service delivery challenges in HIV care during the first year of the COVID-19 pandemic: results from a site assessment survey across the global IeDEA consortium. *J Int AIDS Soc.* 2022 Dec;25(12):e26036. doi: 10.1002/jia2.26036. PMID: 36504431; PMCID: PMC9742047.
- 429) Sinha S, **Kumarasamy N**, Suram VK, Chary SS, Naik S, Singh VB, Jain MK, Suthar CP, Borthakur S, Sawardekar V, Sk N, Reddy N, Talluri L, Thakur P, Reddy M, Panapakam M, Vattipalli R. Efficacy and Safety of Molnupiravir in Mild COVID-19 Patients in India. *Cureus.* 2022 Nov 14;14(11):e31508. doi: 10.7759/cureus.31508. PMID: 36532902; PMCID: PMC9751243.
- 430) Salata RA, Grinsztejn B, Ritz J, Collier AC, Hogg E, Gross R, Godfrey C, **Kumarasamy N**, Kanyama C, Mellors JW, Wallis CL, Hughes MD; ACTG A5288 Study Team. Predictors of virologic outcome among people living with HIV who continue a protease inhibitor-based antiretroviral regimen following virologic failure with no or limited resistance. *AIDS Res Ther.* 2023 Jan 5;20(1):3. doi: 10.1186/s12981-022-00494-9. PMID: 36604746; PMCID: PMC9814171.
- 431) Han WM, Avihingsanon A, Rajasuriar R, Tanuma J, Mundhe S, Lee MP, Choi JY, Pujari S, Chan YJ, Somia A, Zhang F, **Kumarasamy N**, Tek Ng O, Gani Y, Chaiwarith R, Pham TN, Do CD, Ditangco R, Kiertiburanakul S, Khol V, Ross J, Jiamsakul A; IeDEA Asia-Pacific. CD4/CD8 Ratio Recovery Among People Living With HIV Starting With First-Line Integrase Strand Transfer Inhibitors: A Prospective Regional Cohort Analysis. *J Acquir Immune Defic Syndr.* 2023 Feb 1;92(2):180-188. doi: 10.1097/QAI.0000000000003121. PMID: 36625858.

- 432) Thudium RF, Ronit A, Afzal S, Çolak Y, Forman JL, Mendo F, Chen F, Estrada V, **Kumarasamy N**, Nordestgaard BG, Lundgren J, Vestbo J, Kunisaki KM, Nielsen SD; COCOMO, INSIGHT START Pulmonary Substudy and CGPS Study Groups. Faster lung function decline in people living with HIV despite adequate treatment: a longitudinal matched cohort study. *Thorax*. 2023 Jan 13;thoraxjnl-2022-218910. doi: 10.1136/thorax-2022-218910. Epub ahead of print. PMID: 36639241.
- 433) Sornillo JB, Ditangco R, Lumbiganon P, Vu TA, Le ON, Truong KH, Nguyen LV, Do VC, Ounchanum P, Wati DK, Puthanakit T, Kurniati N, Lapphra K, Sudjaritruk T, **Kumarasamy N**, Jamal Mohamed TA, Nik Yusoff NK, Fong SM, Nallusamy RA, Sohn AH, Kariminia A. Disclosure of HIV status and associated clinical outcomes of children and adolescents living with HIV in Asia. *AIDS Care*. 2023 Feb 15:1-10. doi: 10.1080/09540121.2023.2176424. Epub ahead of print. PMID: 36794343.
- 434) Kim S, Hesselning AC, Wu X, Hughes MD, Shah NS, Gaikwad S, **Kumarasamy N**, Mitchell E, Leon M, Gonzales P, Badal-Faesens S, Lourens M, Nerette S, Shenje J, de Koker P, Nedswan S, Mohapi L, Chakalisa UA, Mngqobisa R, Escada RODS, Ouma S, Heckman B, Naini L, Gupta A, Swindells S, Churchyard G; ACTG A5300/IMPAACT 2003 PHOENIX Feasibility Study Team. Factors associated with prevalent Mycobacterium tuberculosis infection and disease among adolescents and adults exposed to rifampin-resistant tuberculosis in the household. *PLoS One*. 2023 Mar 17;18(3):e0283290. doi: 10.1371/journal.pone.0283290. PMID: 36930628; PMCID: PMC10022776.
- 435) INSIGHT START Pulmonary Substudy Group. Pneumoproteins and biomarkers of inflammation and coagulation do not predict rapid lung function decline in people living with HIV. *Sci Rep*. 2023 Mar 23;13(1):4749. PMID: 36959289
- 436) Suwanlerk T, Rupasinghe D, Jantarabenjakul W, An VT, Ross JL, Kariminia A, Van Lam N, Kinikar A, Ounchanum P, Puthanakit T, Nik Yusoff NK, Lumbiganon P, Chokephaibulkit K, Viet DC, Sudjaritruk T, Moy FS, Wati DK, Mohamed TJ, Nallusamy R, **Kumarasamy N**, Khol V, Khanh TH, Kurniati N; TREAT Asia pediatric HIV Observational Database (TApHOD). Lipid and glucose abnormalities and associated factors among children living with HIV in Asia. *Antivir Ther*. 2023 Apr;28(2):13596535231170751. PMID: 37114944
- 437) Lundgren JD, Babiker AG, Sharma S, Grund B, Phillips AN, Matthews G, Kan VL, Aagaard B, Abo I, Alston B, Arenas-Pinto A, Avihingsanon A, Badal-Faesens S, Brites C, Carey C, Casseb J, Clarke A, Collins S, Corbelli GM, Dao S, Denning ET, Emery S, Eriobu N, Florence E, Furrer H, Fätkenheuer G, Gerstoft J, Gisslén M, Goodall K, Henry K, Horban A, Hoy J, Hudson F, Azwa RISR, Kedem E, Kelleher A, Kityo C, Klingman K, Rosa A, Leturque N, Lifson AR, Losso M, Lutaakome J, Madero JS, Mallon P, Mansinho K, Filali KME, Molina JM, Murray DD, **Nagalingeswaran K**, Nozza S, Ormaasen V, Paredes R, Peireira LC, Pillay S, Polizzotto MN, Raben D, Rieger A, Sanchez A, Schechter M, Sedlacek D, Staub T, Touloumi G, Turner M, Madruga JV, Vjecha M, Wolff M, Wood R, Zilmer K, Lane HC, Neaton JD; INSIGHT Strategic Timing of AntiRetroviral Treatment (START) Study Group. Long-Term Benefits from Early Antiretroviral Therapy Initiation in HIV Infection. *NEJM Evid*. 2023 Mar;2(3):10.1056/evidoa2200302. Epub 2023 Feb 27. PMID: 37213438
- 438) Ross J, Rupasinghe D, Avihingsanon A, Lee MP, Pujari S, Sharp G, **Kumarasamy N**, Khusuwan S, Khol V, Agus Somia IK, Pham TN, Kiertiburanakul S, Choi JY, Duy Do C, Sohn AH, Jiamsakul A; TAHOD-LITE study group of IeDEA Asia-Pacific. Trends in hepatitis C virus coinfection and its cascade of care among adults living with HIV in Asia between 2010 and 2020. *PLoS One*. 2023 Jun 28;18(6):e0287909.

- 439) Grinspoon SK, Fitch KV, Zanni MV, Fichtenbaum CJ, Umbleja T, Aberg JA, Overton ET, Malvestutto CD, Bloomfield GS, Currier JS, Martinez E, Roa JC, Diggs MR, Fulda ES, Paradis K, Wiviott SD, Foldyna B, Looby SE, Desvigne-Nickens P, Alston-Smith B, Leon-Cruz J, McCallum S, Hoffmann U, Lu MT, Ribaldo HJ, Douglas PS; REPRIEVE Investigators. Pitavastatin to Prevent Cardiovascular Disease in HIV Infection. *N Engl J Med*. 2023 Aug 24;389(8):687-699. Epub 2023 Jul 23. PMID: 37486775
- 440) Sornillo JB, Ditangco R, Kinikar A, Wati DK, Du QT, Nguyen DQ, Khol V, Nguyen LV, Puthanakit T, Ounchanum P, Kurniati N, Chokephaibulkit K, Jamal Mohamed TA, Sudjaritruk T, Fong SM, **Kumarasamy N**, Kosalaraksa P, Nallusamy RA, Nik Yusoff NK, Sohn AH, Kariminia A; TREAT Asia Pediatric HIV Observational Database of leDEA Asia-Pacific. The changing characteristics of a cohort of children and adolescents living with HIV at antiretroviral therapy initiation in Asia. *PLoS One*. 2023 Sep 14;18(9):e0291523. doi: 10.1371/journal.pone.0291523. PMID: 37708128; PMCID: PMC10501581.
- 441) Jensen TO, Grandits GA, Jain MK, Murray TA, Grund B, Shaw-Saliba K, Matthay MA, Abassi M, Ardelt M, Baker JV, Chen P, Dewar RL, Goodman AL, Hatlen TJ, Highbarger HC, Holodniy M, Lallemand P, Laverdure S, Leshnowar BG, Looney D, Moschopoulos CD, Mugerwa H, Murray DD, Mylonakis E, Nagy-Agren S, Rehman MT, Rupert A, Stevens RA, Turville S, Weintrob A, Wick K, Lundgren J, Ko ER; ACTIV-3/TICO Study Group. Effect of Neutralizing Monoclonal Antibody Treatment on Early Trajectories of Virologic and Immunologic Biomarkers in Patients Hospitalized With COVID-19. *J Infect Dis*. 2024 Mar 14;229(3):671-679. doi: 10.1093/infdis/jiad446. PMID: 37948759; PMCID: PMC10938202.
- 442) Wood BR, **Kumarasamy N**. Early adopters of long-acting injectable cabotegravir/rilpivirine: what lessons can we learn? *AIDS*. 2024 Mar 1;38(3):425-426. PMID: 38300160.
- 443) Aggarwal NR, Nordwall J, Braun DL, Chung L, Coslet J, Der T, Eriobu N, Ginde AA, Hayanga AJ, Highbarger H, Holodniy M, Horcajada JP, Jain MK, Kim K, Laverdure S, Lundgren J, Natarajan V, Nguyen HH, Pett SL, Phillips A, Poulakou G, Price DA, Robinson P, Rogers AJ, Sandkovsky U, Shaw-Saliba K, Sturek JM, Trautner BW, Waters M, Reilly C; ACTIV-3/TICO Study Group. Viral and Host Factors Are Associated With Mortality in Hospitalized Patients With COVID-19. *Clin Infect Dis*. 2024 Jun 14;78(6):1490-1503. doi: 10.1093/cid/ciad780. PMID: 38376212; PMCID: PMC11175705.
- 444) Chen W, Petoumenos K, Somia A, Edmiston N, Chaiwarith R, Woolley I, Ross J, Pujari S, Boettiger DC; International Epidemiology Databases to Evaluate AIDS—Asia Pacific. Changes in atherosclerotic cardiovascular disease risk over time among people living with HIV. *J Antimicrob Chemother*. 2024 Apr 2;79(4):897-902. doi: 10.1093/jac/dkae049. PMID: 38416697; PMCID: PMC10984948.
- 445) Nyein PP, Petoumenos K, Borok M, Eriobu N, **Kumarasamy N**, Avihingsanon A, Azwa I, Dao S, Cisse M, Dharan NJ, Hanson J, Matthews GV. Associations between antiretroviral regimen and changes in blood pressure: results from the D2EFT study. *Clin Infect Dis*. 2024 May 9;ciae256. doi: 10.1093/cid/ciae256. Epub ahead of print. PMID: 38721980.
- 446) D2EFT Study Group. Dolutegravir plus boosted darunavir versus recommended standard-of-care antiretroviral regimens in people with HIV-1 for whom recommended first-line non-nucleoside reverse transcriptase inhibitor therapy has failed (D²EFT): an open-label, randomised, phase 3b/4 trial. *Lancet HIV*. 2024 Jul;11(7):e436-e448. doi:

10.1016/S2352-3018(24)00089-4. Epub 2024 May 21. PMID: 38788744; PMCID: PMC11700562.

- 447) Jensen TO, Murray TA, Grandits GA, Jain MK, Grund B, Shaw-Saliba K, Matthay MA, Abassi M, Ardelt M, Baker JV, Chen P, Dewar RL, Goodman AL, Hatlen TJ, Highbarger HC, Holodny M, Lallemand P, Laverdure S, Leshnowe BG, Looney D, Moschopoulos CD, Mugerwa H, Murray DD, Mylonakis E, Nagy-Agren S, Rehman MT, Rupert A, Stevens R, Turville S, Weintrob A, Wick K, Lundgren J, Ko ER; ACTIV-3/TICO Study Group. Early trajectories of virological and immunological biomarkers and clinical outcomes in patients admitted to hospital for COVID-19: an international, prospective cohort study. *Lancet Microbe*. 2024 Jun;5(6):e559-e569. doi: 10.1016/S2666-5247(24)00015-6. Epub 2024 May 27. PMID: 38815595; PMCID: PMC11181148.
- 448) Kingsley J, **Kumarasamy N**, Abrishamian L, Bonten M, Igbinadolor A, Mekebe-Reuters M, Rosa J, Solai Elango D, Lopez P, Fustier P, Goncalves S, Knutson CG, Kukkaro P, Legenne P, Ramanathan K, Rao S, Reshetnyak E, Stavropoulou V, Stojcheva N, Stumpp MT, Tietz A, Soergel M, Chandra R. The Designed Ankyrin Repeat Protein Antiviral Ensovibep for Nonhospitalized Patients With Coronavirus Disease 2019: Results From EMPATHY, a Randomized, Placebo-Controlled Phase 2 Study. *Open Forum Infect Dis*. 2024 May 3;11(6):ofae233. doi: 10.1093/ofid/ofae233. PMID: 38854392; PMCID: PMC11160321.
- 449) Lee KH, Jiamsakul A, Kiertiburanakul S, Borse R, Khol V, Yuniastuti E, Azwa I, Somia IKA, Chaiwarith R, Pham TN, Khusuwan S, Do CD, **Kumarasamy N**, Gani Y, Ditangco R, Ng OT, Pujari S, Lee MP, Avihingsanon A, Chen HP, Zhang F, Tanuma J, Ross J, Choi JY. Risk factors for toxoplasmosis in people living with HIV in the Asia-Pacific region. *PLoS One*. 2024 Jul 1;19(7):e0306245. doi: 10.1371/journal.pone.0306245. PMID: 38950027; PMCID: PMC11216616.
- 450) Nasab SDS, Eniya ML, Judith A, Clasen F, Faith B, Poongulali S, Gita JB, Ashok C, Raghavi V, Vedavalli S, Lavanya C, Ranganathan K, Rajan G, **Kumarasamy N**, Moyes D, Ide M, Shoaie S, Kurushima Y, Jagdev D, Pun M, Johnson N, Kannian P, Challacombe S. Detection and consistency of mucosal fluid T lymphocyte phenotypes and their relationship with blood, age and gender. *J Immunol Methods*. 2024 Sep;532:113731. doi: 10.1016/j.jim.2024.113731. Epub 2024 Jul 25. PMID: 39059745.
- 451) Rupasinghe D, Choi JY, **Kumarasamy N**, Pujari S, Khol V, Somia IKA, Lee MP, Pham TN, Kiertiburanakul S, Do CD, Avihingsanon A, Ross J, Jiamsakul A; on behalf the International Epidemiology Databases to Evaluate AIDS (IeDEA) Asia-Pacific. Post-Diagnosis HCV RNA Testing Rates Prior to HCV Treatment Among People Living With HIV With HCV Antibody Positivity in the Asia-Pacific Region. *J Viral Hepat*. 2024 Nov;31(11):686-699. doi: 10.1111/jvh.13993. Epub 2024 Aug 8. PMID: 39115260; PMCID: PMC11496006.
- 452) Jiamsakul A, Rupasinghe D, Woolley I, Choi JY, Templeton DJ, Widhani A, Petoumenos K, Tanuma J; TREAT Asia HIV Observational Database (TAHOD) and the Australian HIV Observational Database (AHOD) of IeDEA Asia-Pacific. HIV Treatment Outcomes After 10 years on ART in the TREAT Asia Observational Database and Australian HIV Observational Database. *J Acquir Immune Defic Syndr*. 2024 Dec 15;97(5):460-470. doi: 10.1097. PMID: 39169454; PMCID: PMC11723802.
- 453) Nimkar S, Kinikar A, Mave V, Khol V, Du QT, Nguyen L, Ounchanum P, Nguyen DQ, Puthanakit T, Kosalaraks P, Chokeyhaibulkit K, Sudjaritruk T, Muktiarti D, **Kumarasamy N**, Yusoff NKN, Mohamed T, Wati D, Alam A, Fong S, Nallusamy R,

- Suwanlerk T, Sohn A, Kariminia A; TREAT Asia Pediatric HIV Observational Database of leDEA Asia-Pacific. Long-term risk of mortality and loss to follow-up in children and adolescents on antiretroviral therapy in Asia. *HIV Med.* 2025 Jan;26(1):140-152. doi: 10.1111/hiv.13718. Epub 2024 Sep 26. PMID: 39324422.
- 454) de Waal R, Wools-Kaloustian K, Brazier E, Althoff KN, Jaquet A, Duda SN, **Kumarasamy N**, Savory T, Byakwaga H, Murenzi G, Justice A, Ekouevi DK, Cesar C, Pasayan MKU, Thawani A, Kasozi C, Babakazo P, Karris M, Messou E, Cortes CP, Kunzekwenyika C, Choi JY, Owarwo NC, Niyongabo A, Marconi VC, Ezechi O, Castilho JL, Petoumenos K, Johnson L, Ford N, Kassanje R. Global trends in CD4 count measurement and distribution at first antiretroviral treatment initiation. *Clin Infect Dis.* 2024 Nov 6:ciae548. doi: 10.1093/cid/ciae548. Epub ahead of print. PMID: 39501773.
- 455) Pinsky BA, Sahoo MK, Manasa J, Makadzange T, Wallis CL, Marins EG, **Kumarasamy N**, Bartlett JA, Bosch RJ, Israelski D, Katzenstein DA; A5230 and PARC teams. Nucleic acid amplification testing using dried blood spots to confirm the diagnosis of HIV-1 in adults. *J Clin Virol.* 2024 Dec;175:105746. doi: 10.1016/j.jcv.2024.105746. Epub 2024 Nov 17. PMID: 39566166.
- 456) Papot E, Tovar-Sanchez T, Woods J, Thaurignac G, Eriobu N, Borok M, Kaplan R, Avihingsanon A, Azwa I, Grinsztejn B, **Kumarasamy N**, Sokhela S, Mpoudi-Etame M, Arriaga M, Jacoby S, Matthews GV, Losso MH, Khoo S, Calmy A, Kouanfack C, Ayoub A, Petoumenos K, Venter WDF, Delaporte E, Polizzotto MN; COHIVE study group (COHIVE consortium includes ADVANCE, DoIPHIN2, D2EFT and NAMSAL study groups). SARS-CoV-2 cross-sectional serosurvey across three HIV-1 therapeutic clinical trials in Africa. *AIDS.* 2024 Nov 22. doi: 10.1097. PMID: 39576151.
- 457) Nagawa CS, Selvamuthu P, **Kumarasamy N**, Balakrishnan FB, Rigotti NA, Kruse GR. Patterns and Correlates of Multiple tobacco Product use Among people With HIV in India. *Tob Use Insights.* 2024 Dec 9;17:1179173X241303587. PMID: 39659298; PMCID: PMC11629409.
- 458) Paules CI, Nordwall JA, Shaw-Saliba K, Aberg JA, Gardner EM, Goodman AL, **Kumarasamy N**, Vasudeva S, Vock DM, North CM, Lundgren J, Aggarwal NR; STRIVE Network and TICO Trial Study Group. Blood absolute lymphocyte count and trajectory are important in understanding severe COVID-19. *BMC Infect Dis.* 2025 Jan 15;25(1):67. doi: 10.1186/s12879-024-10428-7. PMID: 39810077; PMCID: PMC11734232
- 459) Vu TT, Rupasinghe D, Khol V, Chaiwarith R, Tanuma J, Kumarasamy N, Khusuwan S, Somia IA, Pujari S, Lee MP, Borse RT, Kiertiburanakul S, Yunihastuti E, Azwa I, Choi JY, Chen HP, Ditangco R, Avihingsanon A, Gani Y, Ross J, Jiamsakul A; leDEA Asia-Pacific. Temporal trends from HIV diagnosis to ART initiation among adults living with HIV in the Asia-Pacific (2013-2023). *AIDS Res Ther.* 2025 Mar 4;22(1):29. doi: 10.1186/s12981-025-00718-8. PMID: 40038791; PMCID: PMC11881487.
- 460) Ballif M, Banholzer N, Perrig L, Avihingsanon A, Nsonde DM, Obatsa S, Muula G, Komona E, Uemura H, Lelo P, Otaalo B, Huwa J, Gouéssé P, Kumarasamy N, Brazier E, Michael D, Rafael I, Ramdé R, Somia IKA, Yotebieng M, Diero L, Euvrard J, Ezechi O, Fenner L; Global leDEA consortium. The long-term impact of the COVID-19 pandemic on tuberculosis care and infection control measures in anti-retroviral therapy (ART) clinics in low- and middle-income countries: a multiregional site survey in Asia and Africa. *BMJ Glob Health.* 2025 Mar 24;10(3):e017828. doi: 10.1136/bmjgh-2024-017828. PMID: 40127942; PMCID: PMC11934364.
- 461) Jensen TO, Sharma S, Avihingsanon A, Lutaakome J, Brar I, Burman W,

- Chetchotisakd P, de Castro N, Galán-Herrera JF, Kumarasamy N, Paredes R, Ridzon R, Sciaudone M, Singh K, Uriel A, Lundgren J, Reilly C, Matthews G. Risk of severe bacterial infections including TB before and after immediate or deferred antiretroviral therapy: A multicenter, prospective, cohort study. *Int J Infect Dis.* 2025 Jul;156:107911. doi: 10.1016/j.ijid.2025.107911. PMID: 40268134; PMCID: PMC12158625.
- 462) Audsley J, Avihingsanon A, Li X, Edwards R, Jackson K, Warner N, Maslac O, Reville P, Lwin HMS, Gatechompol S, Kumarasamy N, Spelman T, Azwa I, Kamarulzaman A, Lewin SR, Sasadeusz J. Kinetics and predictors of Hepatitis B surface antigen (HBsAg) loss after commencing HBV-active antiretroviral therapy (ART) in the setting of HIV-and chronic HBV co-infection. *Clin Infect Dis.* 2025 May 31:ciaf281. doi: 10.1093/cid/ciaf281. PMID: 40447285.
- 463) Fichtenbaum CJ, Malvestutto CD, Watanabe MG, Davies Smith E, Ribaldo HJ, McCallum S, Fitch KV, Currier JS, Diggs MR, Chu SM, Aberg JA, Lu MT, Valencia J, Gómez-Ayerbe C, Brar I, Valdez Madruga J, Bloomfield GS, Douglas PS, Zanni MV, Grinspoon SK; REPRIEVE Investigators. Effects of antiretrovirals on major adverse cardiovascular events in the REPRIEVE trial: a longitudinal cohort analysis. *Lancet HIV.* 2025 Jul;12(7):e496-e505. doi: 10.1016/S2352-3018(25)00043-8. PMID: 40482662; PMCID: PMC12244172.
- 464) Nyein PP, Borok M, Eriobu N, Kaplan R, Kumarasamy N, Avihingsanon A, Losso MH, Azwa I, Karyana M, Dao S, Cisse M, Villanueva JFA, Lupo S, Cardoso SW, Yuniastuti E, Subronto YW, Fitriah M, Katu S, Brown D, Papot E, Hutchinson J, Kelleher A, Hanson J, Dharan NJ, Petoumenos K, Matthews GV; DEFT Study Team. A randomised trial to compare dolutegravir plus boosted darunavir versus recommended standard of care antiretroviral regimens in people with HIV-1, whose first-line non-nucleoside reverse transcriptase inhibitor therapy has failed: Final 96-week results of the D2EFT study. *Clin Infect Dis.* 2025 Jun 27:ciaf346. doi: 10.1093/cid/ciaf346. PMID: 40577173.
- 465) Orkin C, Paterson A, Elias A, Smuk M, Ring K, Volny-Anne A, Calmy A, Hazra A, Geretti AM, Radix A, Titanji BK, Spire B, Del Rio C, Foster C, Moore CB, Cortes CP, Mussini C, Kuritzkes DR, Tan DHS, Martinez E, Wit FWNM, Cresswell F, Venter WDF, Levy I, Zucker J, Molina JM, Hoy J, Arribas J, Llibre JM, Currier J, Rockstroh J, Sutinen J, Gebo K, Waters L, Gisslen M, O'Reilly M, Boffito M, Thompson M, Parczewski M, John M, Gandhi M, Kumarasamy N, Paton N, Mackie N, Cahn P, Elion R, Noe S, Walmsley S, Collins S, Cole-Haley S, Apea V, Short WR, Gilleece Y, Papani S. Establishing shared definitions of virological failure and discontinuation for long-acting injectable cabotegravir and rilpivirine therapy (the CONSENSUS-LAI Study): an international survey and Delphi process. *Lancet HIV.* 2025 Sep;12(9):e649-e659. PMID: 40774264.

Contribution to Book Chapters:

1. A Colour Guide- HIV Disease in India
2. Treatment Guidelines- HIV Disease in India.
3. HIV Disease in India-Handbook for Dental Professionals.
4. Management of the HIV-infected patient (2nd edition) Ed.Crowe,Hoy and Mills
5. Ocular lesions in AIDS in India.
6. WHO Treatment guidelines for Scaling up Antiretroviral Therapy in resource-limited settings- 2003.
7. WHO Guidelines for HIV diagnosis and monitoring of Antiretroviral Therapy- July 2004.
8. The AIDS Pandemic- 2005 Ed. Hank Pizer and Kenneth Mayer
9. The HIV Pandemic: local and global implications
10. WHO Treatment guidelines on Antiretroviral Therapy for HIV infection in Adults and Adolescents in Resource Limited Settings- Towards Universal Access- 2006.
11. WHO Guidelines on Co-trimoxazole prophylaxis for HIV-related infections among Children, Adolescents and Adults in Resource Limited Settings- 2006
12. Management of HIV Infection and Antiretroviral Therapy in Adults and Adolescents management of HIV Infection and Antiretroviral Therapy in Adults and Adolescents-A Clinical Manual 2007- WHO.
13. WHO Treatment guidelines on Antiretroviral Therapy for HIV infection in Adults and Adolescents in Resource Limited Settings- Towards Universal Access- 2010.
14. Diagnosis, Prevention and Management of Cryptococcal Disease in HIV –infected Adults, Adolescents and Children.-WHO Guidelines 2011.
15. WHO Consolidated Treatment Guidelines on the use of Antiretroviral Drugs for treating and preventing HIV infection-June 2013

16. The use of lateral flow urine lipoarabinomannan assay (LF-LAM) for the diagnosis and screening of active tuberculosis in people living with HIV- WHO 2015 Guidelines.
17. WHO Consolidated Treatment Guidelines on the use of Antiretroviral Drugs for treating and preventing HIV infection- Dec 2015
18. The HIV epidemic in South-east Asia: Initial responses towards the UNAIDS 90-90-90 goal. Special Supplement. Journal of virus Eradication. Volume 2, Supplement 4; Nov 2016.
19. WHO Guidelines on the Public Health response to pretreatment HIV drug resistance-July 2017
20. WHO Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy- July 2017
21. WHO Consolidated Treatment Guidelines on the use of Antiretroviral Drugs for treating and preventing HIV infection- July 2018
22. The diagnosis, prevention and management of cryptococcal disease in hiv-infected adults, adolescents and children – WHO Guidelines -March 2018
23. Lateral flow urine lipoarabinomannan assay (LF-LAM) for the diagnosis of active tuberculosis in people living with HIV-WHO Guidelines 2019.
24. WHO Consolidated Treatment Guidelines on the use of Antiretroviral Drugs for treating and preventing HIV infection- July 2019
25. WHO Consolidated Treatment Guidelines on the use of Antiretroviral Drugs for treating and preventing HIV infection- July 2021
26. WHO ARV Treatment Guidelines Update 2025-July 2025

**Outcome of the studies carried out at CART Clinical Research Site,
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4. Described the short term and long adverse effects of Antiretrovirals (ARVs) in Indian patients and Studied the pattern of genotypic mutations among patients failing Antiretroviral Therapy.
5. Randomized Clinical trials carried out at the site answered- When & what to start ART and When and what to switch to?
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Cite

2

Cite

[Initiation of Antiretroviral Therapy in Early Asymptomatic HIV Infection.](#)

INSIGHT START Study Group; Lundgren JD, Babiker AG, Gordin F, Emery S, Grund B, Sharma S, Avihingsanon A, Cooper DA, Fätkenheuer G, Llibre JM, Molina JM, Munderi P, Schechter M, Wood R, Klingman KL, Collins S, Lane HC, Phillips AN, Neaton JD. INSIGHT START Study Group, et al. N Engl J Med. 2015 Aug 27;373(9):795-807. doi: 10.1056/NEJMoa1506816. Epub 2015 Jul 20. N Engl J Med. 2015. PMID: 26192873 Free PMC article. Clinical Trial.

Cite

3

Cite

[Prevention of HIV-1 infection with early antiretroviral therapy.](#)

Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, **Kumarasamy N**, Hakim JG, Kumwenda J, Grinsztein B, Pilotto JH, Godbole SV, Mehendale S, Chariyalertsak S, Santos BR, Mayer KH, Hoffman IF, Eshleman SH, Piwowar-Manning E, Wang L, Makhema J, Mills LA, de Bruyn G, Sanne I, Eron J, Gallant J, Havlir D, Swindells S, Ribaud H, Elharrar V, Burns D, Taha TE, Nielsen-Saines K, Celentano D, Essex M, Fleming TR; HPTN 052 Study Team. Cohen MS, et al. Among authors: **kumarasamy n**. N Engl J Med. 2011 Aug 11;365(6):493-505. doi: 10.1056/NEJMoa1105243. Epub 2011 Jul 18. N Engl J Med. 2011. PMID: 21767103 Free PMC article. Clinical Trial.

Cite

4

Cite

[Dolutegravir plus boosted darunavir versus recommended standard-of-care antiretroviral regimens in people with HIV-1 for whom recommended first-line non-nucleoside reverse transcriptase inhibitor therapy has failed \(D²EFT\): an open-label, randomised, phase 3b/4 trial.](#)

D2EFT Study Group. D2EFT Study Group. Lancet HIV. 2024 Jul;11(7):e436-e448. doi: 10.1016/S2352-3018(24)00089-4. Epub 2024 May 21. Lancet HIV. 2024. PMID: 38788744 Free PMC article. Clinical Trial.

Cite

5

Cite

[Viral and Host Factors Are Associated With Mortality in Hospitalized Patients With COVID-19.](#)

Aggarwal NR, Nordwall J, Braun DL, Chung L, Coslet J, Der T, Eriobu N, Ginde AA, Hayanga AJ, Highbarger H, Holodniy M, Horcajada JP, Jain MK, Kim K, Laverdure S, Lundgren J, Natarajan V, Nguyen HH, Pett SL, Phillips A, Poulakou G, Price DA, Robinson P, Rogers AJ, Sandkovsky U, Shaw-Saliba K, Sturek JM, Trautner BW, Waters M, Reilly C; ACTIV-3/TICO Study Group. Aggarwal NR, et al. Clin Infect Dis. 2024 Jun 14;78(6):1490-1503. doi: 10.1093/cid/ciad780. Clin Infect Dis. 2024. PMID: 38376212 Free PMC article. Clinical Trial.

Cite

6

Cite

[Effects of antiretrovirals on major adverse cardiovascular events in the REPRIEVE trial: a longitudinal cohort analysis.](#)

Fichtenbaum CJ, Malvestutto CD, Watanabe MG, Davies Smith E, Ribaud HJ, McCallum S, Fitch KV, Currier JS, Diggs MR, Chu SM, Aberg JA, Lu MT, Valencia J, Gómez-Ayerbe C, Brar I, Valdez Madruga J, Bloomfield GS, Douglas PS, Zanni MV, Grinspoon SK; REPRIEVE Investigators. Fichtenbaum CJ, et al. Lancet HIV. 2025 Jul;12(7):e496-e505. doi: 10.1016/S2352-3018(25)00043-8. Epub 2025 Jun 4. Lancet HIV. 2025. PMID: 40482662 Clinical Trial.

Cite

7

Cite

[Retroperitoneal sarcomas.](#)

Kumarasamy NA, Gayer G. **Kumarasamy NA**, et al. Semin Ultrasound CT MR. 2011 Oct;32(5):422-32. doi: 10.1053/j.sult.2011.06.002. Semin Ultrasound CT MR. 2011. PMID: 21963163 Review.

Cite

8

Cite

[Efficacy and Safety of Ensovibep for Adults Hospitalized With COVID-19 : A Randomized Controlled Trial.](#)

ACTIV-3/TICO Study Group; Barkauskas C, Mylonakis E, Poulakou G, Young BE, Vock DM, Siegel L, Engen N, Grandits G, Mosaly NR, Vekstein AM, Rogers R, Shehadeh F, Kaczynski M, Mylona EK, Syrigos KN, Rapti V, Lye DC, Hui DS, Leither L, Knowlton KU, Jain MK, Marines-Price R, Osuji A, Overcash JS, Kalomenidis I, Barmpareassou Z, Waters M, Zepeda K, Chen P, Torbati S, Kiweewa F, Sebudde N, Almasri E, Hughes A, Bhagani SR, Rodger A, Sandkovsky U, Gottlieb RL, Nnakelu E, Trautner B, Menon V, Lutaakome J, Matthay M, Robinson P, Protopapas K, Koulouris N, Kimuli I, Baduashvili A, Braun DL, Günthard HF, Ramachandrani S, Kidega R, Kim K, Hatlen TJ, Phillips AN, Murray DD, Jensen TO, Padilla ML, Accardi EX, Shaw-Saliba K, Dewar RL, Teitelbaum M, Natarajan V, Laverdure S, Highbarger HC, Rehman MT, Vogel S, Vallée D, Crew P, Atri N, Schechner AJ, Pett S, Hudson F, Badrock J, Touloumi G, Brown SM, Self WH, North CM, Ginde AA, Chang CC, Kelleher A, Nagy-Agren S, Vasudeva S, Looney D, Nguyen HH, Sánchez A, Weintrob AC, Grund B, Sharma S, Reilly CS, Paredes R, Bednarska A, Gerry NP, Babiker AG, Davey VJ, Gelijns AC, Higgs ES, Kan V, Matthews G, Thompson BT, Legenne P, Chandra R, Lane HC, Neaton JD, L... [See abstract for full author list →](#) ACTIV-3/TICO Study Group, et al. Ann Intern Med. 2022 Sep;175(9):1266-1274. doi: 10.7326/M22-1503. Epub 2022 Aug 9. Ann Intern Med. 2022. PMID: 35939810 Free PMC article. Clinical Trial.

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9

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[Early trajectories of virological and immunological biomarkers and clinical outcomes in patients admitted to hospital for COVID-19: an international, prospective cohort study.](#)

Jensen TO, Murray TA, Grandits GA, Jain MK, Grund B, Shaw-Saliba K, Matthay MA, Abassi M, Ardelt M, Baker JV, Chen P, Dewar RL, Goodman AL, Hatlen TJ, Highbarger HC, Holodniy M, Lallemand P, Laverdure S, Leshnowar BG, Looney D, Moschopoulos CD, Mugerwa H, Murray DD, Mylonakis E, Nagy-Agren S, Rehman MT, Rupert A, Stevens R, Turville S, Weintrob A, Wick K, Lundgren J, Ko ER; ACTIV-3/TICO Study Group. Jensen TO, et al. Lancet Microbe. 2024 Jun;5(6):e559-e569. doi: 10.1016/S2666-5247(24)00015-6. Epub 2024 May 27. Lancet Microbe. 2024. PMID: 38815595 Free PMC article.

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[Repurposed Antiviral Drugs for Covid-19 - Interim WHO Solidarity Trial Results.](#)

WHO Solidarity Trial Consortium; Pan H, Peto R, Henao-Restrepo AM, Preziosi MP, Sathiyamoorthy V, Abdool Karim Q, Alejandria MM, Hernández García C, Kieny MP, Malekzadeh R, Murthy S, Reddy KS, Roses Periago M, Abi Hanna P, Ader F, Al-Bader AM, Alhasawi A, Allum E, Alotaibi A, Alvarez-Moreno CA, Appadoo S, Asiri A, Aukrust P, Barratt-Due A, Bellani S, Branca M, Cappel-Porter HBC, Cerrato N, Chow TS, Como N, Eustace J, García PJ, Godbole S, Gotuzzo E, Griskevicius L, Hamra R, Hassan M, Hassany M, Hutton D, Irmansyah I, Jancoriene L, Kirwan J, Kumar S, Lennon P, Lopardo G, Lydon P, Magrini N, Maguire T, Manevska S, Manuel O, McGinty S, Medina MT, Mesa Rubio ML, Miranda-Montoya MC, Nel J, Nunes EP, Perola M, Portolés A, Rasmin MR, Raza A, Rees H, Reges PPS, Rogers CA, Salami K, Salvadori MI, Sinani N, Sterne JAC, Stevanovikj M, Tacconelli E, Tikkinen KAO, Trelle S, Zaid H, Røttingen JA, Swaminathan S. WHO Solidarity Trial Consortium, et al. N Engl J Med. 2021 Feb 11;384(6):497-511. doi: 10.1056/NEJMoa2023184. Epub 2020 Dec 2. N Engl J Med. 2021. PMID: 33264556 Free PMC article. Clinical Trial.

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ARTICLE TYPE

- Adaptive Clinical Trial
- Address
- Autobiography
- Bibliography
- Biography
- Books and Documents
- Case Reports
- Classical Article
- Clinical Conference
- Clinical Study
- Clinical Trial
- Clinical Trial Protocol
- Clinical Trial, Phase I
- Clinical Trial, Phase II
- Clinical Trial, Phase III
- Clinical Trial, Phase IV
- Clinical Trial, Veterinary
- Collected Work
- Comment
- Comparative Study
- Congress
- Consensus Development Conference

- Consensus Development Conference, NIH
- Controlled Clinical Trial
- Corrected and Republished Article
- Dataset
- Dictionary
- Directory
- Duplicate Publication
- Editorial
- Electronic Supplementary Materials
- English Abstract
- Equivalence Trial
- Evaluation Study
- Expression of Concern
- Festschrift
- Government Publication
- Guideline
- Historical Article
- Interactive Tutorial
- Interview
- Introductory Journal Article
- Lecture
- Legal Case
- Legislation
- Letter
- Meta-Analysis
- Multicenter Study
- Network Meta-Analysis
- News
- Newspaper Article
- Observational Study
- Observational Study, Veterinary
- Overall
- Patient Education Handout
- Periodical Index
- Personal Narrative
- Portrait
- Practice Guideline
- Pragmatic Clinical Trial
- Preprint
- Published Erratum
- Randomized Controlled Trial
- Randomized Controlled Trial, Veterinary
- Research Support, American Recovery and Reinvestment Act
- Research Support, N.I.H., Extramural
- Research Support, N.I.H., Intramural
- Research Support, Non-U.S. Gov't
- Research Support, U.S. Gov't, Non-P.H.S.
- Research Support, U.S. Gov't, P.H.S.

Research Support, U.S. Gov't

- Retracted Publication
- Retraction of Publication
- Review
- Scientific Integrity Review
- Scoping Review
- Systematic Review
- Technical Report
- Twin Study
- Validation Study
- Video-Audio Media
- Webcast

Cancel Apply

Close dialog

ARTICLE LANGUAGE

- Afrikaans
- Albanian
- Arabic
- Armenian
- Azerbaijani
- Bosnian
- Bulgarian
- Catalan
- Chinese
- Croatian
- Czech
- Danish
- Dutch
- English
- Esperanto
- Estonian
- Finnish
- French
- Georgian
- German
- Greek, Modern
- Hebrew
- Hindi
- Hungarian
- Icelandic
- Indonesian
- Italian
- Japanese
- Kinyarwanda
- Korean
- Latin

- Latvian
- Lithuanian
- Macedonian
- Malay
- Malayalam
- Maori
- Multiple Languages
- Norwegian
- Persian
- Polish
- Portuguese
- Pushto
- Romanian
- Russian
- Sanskrit
- Scottish gaelic
- Serbian
- Slovak
- Slovenian
- Spanish
- Swedish
- Thai
- Turkish
- Ukrainian
- Undetermined
- Vietnamese
- Welsh

Cancel Apply

Close dialog

AGE

- Child: birth-18 years
- Newborn: birth-1 month
- Infant: birth-23 months
- Infant: 1-23 months
- Preschool Child: 2-5 years
- Child: 6-12 years
- Adolescent: 13-18 years
- Adult: 19+ years
- Young Adult: 19-24 years
- Adult: 19-44 years
- Middle Aged + Aged: 45+ years
- Middle Aged: 45-64 years
- Aged: 65+ years
- 80 and over: 80+ years

Cancel Apply

Close dialog

Filters on the sidebar will be reset to the default list and any currently applied filters will be cleared.

Confirm [x]

Back to Top

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Jump

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PubMed® comprises more than 39 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

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Trending Articles

PubMed records with recent increases in activity

- [Shear stress governs hematopoietic stem cell fate to promote inflammation-induced aging.](#)
Shang T, et al. Nat Aging. 2026. PMID: 41482519
- [Streptococcus anginosus-derived methionine promotes gastric cancer progression.](#)
Zhou CB, et al. Gut. 2026. PMID: 41482458
- [Greater fluid overload and lower interdialytic weight gain are independently associated with mortality in a large international hemodialysis population.](#)
Hecking M, et al. Nephrol Dial Transplant. 2018. PMID: 29688512 Free PMC article.
- [Quality over Quantity: Organic Compounds Altering the Antarctic Sea Spray Aerosol Concentrations.](#)
Dall'osto M, et al. Environ Sci Technol. 2026. PMID: 41489287
- [Global, regional, and national burden of chronic respiratory diseases and impact of the COVID-19 pandemic, 1990-2023: a Global Burden of Disease study.](#)
Oh J, et al. Nat Med. 2026. PMID: 41495401

See more trending articles

PubMed Updates

Feature updates and other PubMed highlights

- [Recent Changes to References, Search Tools, Related Citations, and Sharing Features](#)

June 27, 2025

Key changes include improved rendering of reference lists, the addition of date stamps in search history downloads, streamlined sharing options, and other usability updates.

- [FTP Improvements Available for Testing](#)

June 6, 2025

Starting with the annual baseline release in December 2025, the content of PubMed data distributed via FTP will be generated using the same technology as the PubMed website and E-utilities API; this update means the FTP data will match the PubMed website and API.

- [**Changes to Email Feature**](#)

May 30, 2025

PubMed will soon reintroduce the ability to customize subject lines and body text when emailing search results or citations. With this update, the email feature will also require My NCBI login, and PubMed emails will only be sent to the email address associated with the My NCBI account.

- [**Phrase Searching in PubMed Tutorial Now Available**](#)

March 3, 2025

With hands-on exercises and quizzes, this tutorial will walk you through how to construct PubMed phrase searches.

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PubMed Advanced Search Builder



[User Guide](#)

Filters applied: . [Clear all](#)

Add terms to the query box

Search Term: Field Selector:

Select indexed value

Start Date:

to

End Date:

ADD

- [Add with AND](#)
- [Add with OR](#)
- [Add with NOT](#)

[Show Index](#)

Query box

Query box

Search

- [Add to History](#)
- [Search](#)

Your saved search

Name of saved search:

Search terms:

[Test search terms](#)

Would you like email updates of new search results?

Saved Search Alert Radio Buttons

- Yes
- No

Email: ([change](#))

Frequency: Monthly

Which day? The first Sunday

Which day? Sunday

Report format: Summary

Send at most: 5 items

Send even when there aren't any new results

Optional text in email:

Save Cancel

History and Search Details

Your history is currently empty! As you use PubMed your recent searches will appear here.

Download

Delete

Your entire search history is about to be cleared.

Confirm [x]

The search history record is about to be deleted.

Confirm [x]

No History items are available for download.

History items expire after 8 hour of inactivity.

Click 'Refresh' to clear items from the table,

or click the 'X' to go back to the table.

Refresh [x]

The history table currently contains expired items.

Clear expired items and add your new query?

Continue [x]

No History items are available for deletion.

History items expire after 8 hour of inactivity.

Click 'Refresh' to clear items from the table,

or click the 'X' to go back to the table.

Refresh [x]

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Display options

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Your entire clipboard is about to be cleared.

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Search

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FAQs

PubMed User Guide

Last update: June 25, 2025

Follow [PubMed New and Noteworthy](#) for brief announcements highlighting recent enhancements and changes to PubMed.

FAQs

- How can I [get the full text article](#)? What if the [link to the full text is not working](#)?
- How do I [search by author](#)?
- How do I [search by journal name](#)?
- How do I [find a specific citation](#)? I have some information such as the author, journal name, and publication year.
- I retrieved too many citations. [How can I focus my search](#)?
- I retrieved too few citations. [How can I expand my search](#)?
- How do I find [consumer health information about a disease or condition](#)?
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- How can I [download PubMed](#)?
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Search PubMed

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- [I retrieved too many citations. How can I focus my search?](#)
- [I retrieved too few citations. How can I expand my search?](#)
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- [Searching by author](#)
- [Searching by journal](#)
- [Searching by date](#)
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- [Combining search terms with Boolean operators \(AND, OR, NOT\)](#)
- [Using search field tags](#)
- [Proximity searching](#)

How do I search PubMed?

1. Identify the key concepts for your search.
2. Enter the terms (or key concepts) in the search box.
3. Press the Enter key or click Search.

For many searches, it is not necessary to use special tags or syntax. PubMed uses multiple tools to help you find relevant results:

- Best Match sort order uses a state-of-the-art machine learning algorithm to place the most relevant citations at the top of your results.
- An autocomplete feature displays suggestions as you type your search terms. This feature is based on PubMed query log analysis described in "[Finding Query Suggestions for PubMed](#)."
- A spell checking feature suggests alternative spellings for search terms that may include misspellings.
- A citation sensor displays suggested results for searches that include terms characteristic of citation searching, e.g., author names, journal titles, publication dates, and article titles.

I retrieved too many citations. How can I focus my search?

To limit the number of search results:

- Replace general search terms with more specific ones (e.g., low back pain instead of back pain).
- Include additional terms in your query.
- Use the sidebar filters to restrict results by publication date, full text availability, article type, and more.

I retrieved too few citations. How can I expand my search?

- On the abstract page for a citation, see the [Similar Articles](#) section for a pre-calculated set of additional PubMed citations closely related to that article.
- Remove extraneous or specific terms from the search box.
- Try using alternative terms to describe the concepts you are searching.

Find a specific citation

Paste the article title into the search box, or enter citation details such as the author, journal name and the year the article was published in the search box and the PubMed citation sensor will automatically analyze your query for citation information to return the correct citation. The citation sensor incorporates a fuzzy matching algorithm and will retrieve the best match even if a search includes an incorrect term. You do not need to use field tags or Boolean operators.

Searching by author

Enter the author's last name and initials without punctuation in the search box, and click Search.

If you only know the author's last name, use the author search field tag [au], e.g., brody[au].

Names entered using either the lastname+initials format (e.g., smith ja) or the full name format (john a smith) and no search tag are searched as authors as well as collaborators, if they exist in PubMed.

Enter a full author name in natural or inverted order, e.g., julia s wong or wong julia s.

- Prior to 2002, full author names were not included on PubMed citations, so full author name searches will only retrieve citations from 2002 forward, when the full author name was published in the article.
- A comma following the last name for searching is optional. For some names, however, it is necessary to distinguish which name is the last name by using the comma following the last name, e.g., james, ryan.

Omit periods after initials and put all suffixes at the end, e.g., vollmer charles jr

Initials and suffixes are not required. If you include a middle initial or suffix, you will only retrieve citations for articles that were published using the middle initial or suffix.

More information about author searching:

- To search by author using the search builder, click [Advanced search](#) and then select Author from the All Fields menu. The author search box includes an autocomplete feature.
- You may click an author link on the abstract display to execute a search for the author in PubMed. Results will display using a ranking algorithm if the author name is computationally similar for additional PubMed citations.
- If an author name includes only [stopwords](#), use the author search field tag [au] to search in combination with other terms, e.g., just by[au] seizure.
- Author names are automatically [truncated](#) to account for varying initials and designations such as Jr. To turn off the truncation, use double quotes around the author's name with the author search field tag [au], e.g., "smith j" [au].
- Use the search field tag [1au] to search for the first personal author or [lastau] to search for the last personal author name in a citation.

For additional information on author names in PubMed, please see the journal article, "[Author Name Disambiguation for PubMed](#)."

Searching by journal

Enter one of the following in the search box:

- full journal title (e.g., molecular biology of the cell)
- title abbreviation (e.g., mol biol cell)
- ISSN number, a standardized international code (e.g., 1059-1524)

More information about journal searching:

- To search by journal using the search builder, click [Advanced search](#) and then select Journal from the All Fields menu. The journal search box includes an autocomplete feature.
- To find full journal names, use the [NLM Catalog](#), or mouseover the journal title abbreviation on the citation (available in abstract view).
 1. Click Journals in NCBI Databases on the PubMed homepage.
 2. Enter the journal name and click Search.
- Use the journal search field tag [ta] to limit your search to the journal only, e.g., gene therapy[ta], scanning[ta]
- Searching with the full journal title or abbreviation is recommended for complete retrieval of indexed items; older citations may not have an ISSN.
- If a journal title or abbreviation includes a special character (e.g., parentheses, brackets, &), enter the title or abbreviation without the special characters. For example, to search by the journal abbreviation j hand surg [am], enter j hand surg am.
- Searching for a journal will automatically map to the official journal title and the title associated with an alternative title, if one exists. To turn off this automatic mapping enter the journal in double quotes and tag with [ta], e.g., "science"[ta].

A [list of journals](#) included in PubMed is available by FTP.

Searching by date

- [Using the results timeline](#)
- [Using the search builder](#)
- [Searching by a single date in the search box](#)
- [Searching for a date range in the search box](#)
- [Searching for a relative date range](#)

Using the results timeline

Click and drag the sliders on the Publication Date timeline to change the date range for your search.

Note: The Publication Date timeline counts all publication dates for a citation as supplied by the publisher, e.g., print and electronic publication dates. These dates may span more than one year; for example, an article that was published online in November 2018 and published in a print issue in January 2019. This means the sum of results represented in the timeline may differ from the search results count.

Using the search builder

1. Click [Advanced search](#) and use the search builder.
2. Select a date field from the All Fields menu, e.g., Date – Publication, and enter a single date or a date range in the fill-in-the-blank boxes. Month and day are optional. If you want to search for a date range up to the current date, do not edit the ‘Present’ date box.
3. Add the date from the builder to the query box.
4. Once you have finished adding terms to the query box, click Search (or Add to History) to run the search.

Searching by a single date in the search box

Enter dates using the format yyyy/mm/dd [date field]. The month and day are optional.

Use a [Boolean operator](#) when combining a date with other search terms.

Example

Use the Boolean operator AND to limit your search to a specific publication date.

[cancer AND 2020/06/01\[dp\]](#)

The available date fields are:

- [Date of Publication \[dp\]](#) - Date searching includes both print and electronic dates of publication. Searching for a single date does not include items when the electronic date of publication is after the print date.
- Electronic Date of Publication (if applicable) [epdat]
- Print Date of Publication (if applicable) [ppdat]
- [Entry Date \[edat\]](#) - Date used for PubMed processing, such as “Most Recent” sort order.
- [MeSH Date \[mhda\]](#) - The date the citation was indexed with MeSH terms.
- [Create Date \[crdt\]](#) - The date the PubMed record was first created.

Searching for a date range in the search box

Enter date ranges using a colon (:) between each date followed by a [date field].

Use a [Boolean operator](#) when combining a date range with other search terms.

Example

Use the Boolean operator AND to limit your search to a date range.

[heart disease AND 2019/01/01:2019/12/01\[dp\]](#)

Comprehensive searches for a full year should be entered as 2000:2000[dp] rather than 2000[dp] to retrieve citations with a different print and electronic year of publication.

Date range searching includes both print and electronic dates of publication.

Searching for a relative date range

Use the following format to search for a relative date range:

- term="last **X** days"**[date field]**
- term="last **X** months"**[date field]**
- term="last **X** years"**[date field]**

where **X** is the number of days, months or years immediately preceding today's date and **[date field]** is the date field tag: [dp], [edat] or [crdt].

The relative date range search for publication dates will also include citations with publication dates after today's date; therefore, citations with publication dates in the future will be included in the results.

Filters

You can use filters to narrow your search results by [publication date](#), [text availability](#), [article attribute](#), [article type](#), [article language](#), [species](#), [sex](#), [age](#), and [other](#).

To apply a filter:

1. Run a search in PubMed.
2. Click the filter you would like to activate from the sidebar. A check mark will appear next to the activated filter(s).
3. Subsequent searches will be filtered until the selected filters are turned off, or until your browser data is cleared.
4. A green "Filters applied" message will display at the top of the results page when filters are applied to your search.

The most frequently used filters appear on the sidebar by default. More filters are available for some categories:

1. Click the "See all ... filters" link for a filter category.
2. A pop-up menu will appear showing all available filters for that category.
3. Select the filter(s) you would like to apply to your search.
 - To cancel your selections, click Cancel or click on the X in the upper right corner to close the pop-up and return to your search results.
4. Click Apply. This will close the pop-up menu, apply the selected filter(s) to your search, and display your selection(s) on the sidebar.
 - The selected filter(s) will appear on the sidebar in addition to the default filters until your browser cookies are cleared, or you click the "Reset filters display" button at the bottom of the sidebar.

Clearing applied filters:

- To turn off all currently applied filters, click the "Clear filters" link in the green "Filters applied" message at the top of the page, or click the "Clear all filters" button at the bottom of the sidebar.
- To turn off individual filters, click the filter on the sidebar.
- To reset the filters shown on the sidebar to the default filter list, click the "Reset filters display" button at the bottom of the sidebar. This will also clear any currently applied filters.

More information about filters:

- Many filters under the Additional Filters section limit your search results to citations that have been assigned specific MeSH terms during MEDLINE indexing. This means these filters may exclude some otherwise relevant

results that do not include the associated MeSH terms.

- See [Filter search strategies](#) for the equivalent PubMed query for each filter.
- You can activate additional filters with [My Custom filters](#). Once activated, these filters will appear at the top of your sidebar under "My Custom Filters".

Publication date filters

To filter your results by Publication Date, click 1 year, 5 years, 10 years, or enter a custom range. The 1 year, 5 years, and 10 years filters [search for a relative date range](#) based on today's date.

Publication Date filters include both electronic and print publication dates.

Text availability filters

To filter your results to only citations that include a link to full text, a link to free full text, or an abstract, click the appropriate selections.

Alternatively, you may search for citations with links to full text, free full text or include an abstract using the values: full text[sb], free full text[sb], or 'hasabstract'. No search field tag is required for hasabstract. You may also search for all citations with a structured abstract with 'hasstructuredabstract'.

Note: Most citations in PubMed to articles published before 1975 do not include abstracts.

Article attribute filter

Use the associated data filter to find citations that include secondary source databanks and accession numbers. These data links connect to records in other NLM databases (for example: GenBank, ClinicalTrials.gov) or external data repositories (for example: figshare, Dryad). Data links are provided by the publisher and/or by data repositories through participation in NCBI's LinkOut service.

Article type filters

Use article type filters to narrow your results based on the content or style of the article, such as: Clinical Trial or Review. Article types are also called publication types.

You can add more article type filters to the sidebar using the "See all article type filters" link. The complete list of [publication types found in PubMed](#) is available.

Article type filters rely on citations' Publication Type [pt] data except for the [Systematic Review filter](#), which uses a search strategy in addition to the publication type.

Publication type data may be supplied by the publisher or assigned during the MEDLINE indexing process. Therefore, these filters may exclude some citations that have not yet completed the MEDLINE indexing process.

Systematic reviews

To search for systematic reviews in PubMed, use the Systematic Review article type filter on the sidebar, or enter your search terms followed by AND systematic[sb] in the search box. For example, lyme disease AND systematic[sb].

The Systematic Review filter uses a [search strategy](#) in addition to the Systematic Review publication type [pt] to find systematic reviews in PubMed. To limit your search to only those citations with the Systematic Review publication type, use the [publication type](#) search tag[pt], i.e., systematic review[pt]; however, this may exclude some relevant citations that have not yet completed the MEDLINE indexing process.

Article language filters

Language filters restrict your search to articles published in the selected language(s). You can add more language filters to the sidebar using the "See all article language filters" link.

By default, PubMed displays English language titles and abstracts when provided by the publisher. Check the Abstract display for links to view the abstract in other languages (when available).

Article language filters are located under the Additional Filters section.

Species filters

Species filters restrict your results to human or animal studies:

- Humans
- Other Animals

Species filters limit your search results to citations that were assigned [the associated MeSH terms for species](#) during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE.

Species filters are located under the Additional Filters section.

Sex filters

Sex filters restrict your search results to a specific sex for an animal or human study:

- Female
- Male

Sex filters limit your search results to citations that were assigned [the associated MeSH terms for sex](#) during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE.

Sex filters are located under the Additional Filters section.

Age filters

Age filters restrict results to a specific age group for a human study.

Age filters limit your search results to citations that were assigned [the associated MeSH terms for age](#) during MEDLINE indexing. These filters will typically deliver precise results but can also exclude some otherwise relevant results that do not include the associated MeSH terms on their PubMed record. For example, some citations are not indexed for MEDLINE, such as preprints, Online Ahead of Print citations, and U.S. government-funded research published in journals that are not indexed for MEDLINE.

Age filters are located under the Additional Filters section. You can add more age filters to the sidebar using the "See all age filters" link.

Age filters include:

- Child: birth-18 years
- Newborn: birth-1 month
- Infant: birth-23 months
- Infant: 1-23 months
- Preschool Child: 2-5 years
- Child: 6-12 years
- Adolescent: 13-18 years
- Adult: 19+ years
- Young Adult: 19-24 years
- Adult: 19-44 years
- Middle Aged + Aged: 45+ years
- Middle Aged: 45-64 years
- Aged: 65+ years
- 80 and over: 80+ years

Other filters & more subsets

Exclude preprints

The Exclude preprints filter will exclude preprint citations from your search results. Alternatively, you can exclude preprints from your search results by including NOT preprint[pt] at the end of your query.

See [Preprints](#) for more information about preprint citations in PubMed.

The Exclude preprints filter is located under the Additional Filters section.

MEDLINE Subset

The MEDLINE filter limits results to citations that are indexed for MEDLINE. To use this filter in a query, add medline[sb] to your search.

The MEDLINE filter is located under the Additional Filters section.

PubMed Central Subset

To restrict retrieval to citations that have a free full text article available in [PubMed Central](#) (PMC), search "pubmed pmc"[sb].

Use the [PMID/PMCID/NIHMSID Converter](#) to convert IDs for publications referenced in PubMed and PMC. To retrieve citations that include an NIHMS ID use the query, hasnihmsid.

Citation Status Subsets

The citation status indicates the internal processing stage of an article in the PubMed database (see [PubMed Citation Status Subsets](#)).

To search for a particular citation status, enter one of the search terms below followed by the [sb] search tag:

- publisher
- inprocess
- medline

- pubmednotmedline

To search for the total number of PubMed citations, enter all[*sb*] in the search box.

Ahead of Print Citations

Publishers may submit citations for articles that appear on the web prior to their publication in final or print format. To search for these ahead-of-print citations, enter *pubstatusaheadofprint*.

Searching for a phrase

Many phrases are recognized by the subject translation table used in [PubMed's Automatic Term Mapping \(ATM\)](#). For example, if you enter fever of unknown origin, PubMed recognizes this phrase as a MeSH Term.

You can bypass ATM and search for a specific phrase using the following formats:

- Enclose the phrase in double quotes: "kidney allograft"
 - If you use quotes and the phrase is not found in the [phrase index](#), the quotes are ignored and the terms are processed using automatic term mapping. The message "Quoted phrase not found in phrase index" will display at the top of your search results.
- Use a search tag: kidney allograft[*tw*]
 - If you use a search tag and the phrase is not found in the [phrase index](#), the phrase will be broken into separate terms. For example, "psittacine flight" is not in the phrase index, so a search for psittacine flight[*tw*] is broken up and translated as: (((("psittaciformes"[MeSH Terms] OR "psittaciformes"[All Fields]) OR "psittacine"[All Fields]) OR "psittacines"[All Fields]) AND "flight"[Text Word])
- Use a hyphen: kidney-allograft
 - If you use a hyphen and the phrase is not found in the [phrase index](#), the search will not return any results for that phrase.
 - Hyphenated phrases matching a MeSH term or entry term will include those terms in the search translation. If you want to prevent such mapping, put the hyphenated phrase inside double quotes: "heart-attack"

When you enter search terms as a phrase, PubMed will not perform automatic term mapping that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy. For example, "health planning" will include citations that are indexed to the MeSH term, Health Planning, but will not include the more specific terms, e.g., Health Care Rationing, Health Care Reform, Health Plan Implementation, that are included in the automatic MeSH mapping.

Phrase index

PubMed uses a phrase index to provide phrase searching. To browse the phrase index, use the [Show Index feature](#) included in the [Advanced Search](#) builder: select a search field, enter the beginning of a phrase, and then click Show Index.

Quoted phrase not found

Phrases may appear in a PubMed record but not be in the phrase index. To search for a phrase that is not found in the phrase index, use a [proximity search](#) with a distance of 0 (e.g., "[cognitive impairment in multiple sclerosis](#)"[*tiab*:~0]); this will search for the quoted terms appearing next to each other, in any order.

Automated processes regularly add new phrases to the index based on standard criteria such as phrase frequency and length. If you would like to request a phrase be added to the phrase index, please [write to the NLM Help Desk](#).

Wildcards and truncation

To create a wildcard search in PubMed, use an asterisk (*) to substitute for 0 or more characters in a term or phrase. For example, "[vaccin* schedul*](#)" will find results that include "vaccine schedule", "vaccine scheduling", "vaccination schedules", and more variations of this phrase.

- A wildcard (*) substitutes for 0 or more characters
- Terms must begin with at least 4 characters before the first wildcard: colo*
- Multiple wildcards can be used in the same term: organi*ation*

To use wildcards in a phrase search, use any of the following formats:

- Enclose the phrase in double quotes: "breast feed*"
- Use a search tag: breast feed*[tiab]
- Use a hyphen: breast-feed*

Phrases can include more than one wildcard: "[colo* cancer*](#)"

Wildcards turn off [Automatic Term Mapping \(ATM\)](#) and the process that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy. For example, "heart attack*" will not map to the MeSH term Myocardial Infarction or include any of the more specific terms, e.g., Myocardial Stunning; Shock, Cardiogenic.

Wildcards can be particularly useful to capture variations of a phrase, since phrase searches already turn off automatic term mapping and do not otherwise include alternate spellings or singular/plural forms. For example, searching for "tumo*r associated macrophage*" retrieves variations of the phrase such as: "tumor associated macrophage", "tumour associated macrophage", "tumor associated macrophages", and "tumour associated macrophages".

Combining search terms with Boolean operators (AND, OR, NOT)

PubMed applies an AND operator between concepts, e.g., "vitamin c common cold" is translated as vitamin c AND common cold. Enter Boolean operators in uppercase characters to combine or exclude search terms:

- AND retrieves results that include all the search terms.
- OR retrieves results that include at least one of the search terms.
- NOT excludes the retrieval of terms from your search.

PubMed processes searches in a left-to-right sequence. Use parentheses to "nest" concepts that should be processed as a unit and then incorporated into the overall search.

- PubMed uses automatic term mapping to identify concepts. For example, for the search air bladder fistula, PubMed will search "air bladder" as a phrase. If you do not want this automatic phrase parsing, enter each term separated by the Boolean operator AND, e.g., air AND bladder AND fistula.
- [Search Details](#) show how a search was translated.

Using search field tags

You can search for a term in a specific field by including a [search field tag](#) after the term; for example, UCLA[ad] will search for the term "UCLA" in the affiliation field only.

More information about using search field tags:

- The search field tag must be enclosed in square brackets.
- Case and spacing do not matter: crabs [mh] = Crabs[mh].
- Search field tags turn off [Automatic Term Mapping \(ATM\)](#), limiting your search to the specified term only.
- Using a search field tag after multiple terms will attempt to [search those terms as a phrase](#): kidney allograft[tiab].

To search multiple terms in the same field, each term must be tagged individually: covid-19[ti] vaccine[ti] children[ti].

- The [Advanced Search builder](#) can help you search for terms in specific fields and build large, complex search strings.

Search field tags

- [Affiliation \[ad\]](#)
- [All Fields \[all\]](#)
- [Article Identifier \[aid\]](#)
- [Author \[au\]](#)
- [Author Identifier \[auid\]](#)
- [Book \[book\]](#)
- [Comment Correction Type](#)
- [Completion Date \[dcom\]](#)
- [Conflict of Interest Statement \[cois\]](#)
- [Corporate Author \[cn\]](#)
- [Create Date \[crdt\]](#)
- [EC/RN Number \[rn\]](#)
- [Editor \[ed\]](#)
- [Entry Date \[edat\]](#)
- [Filter \[filter\] \[sb\]](#)
- [First Author Name \[1au\]](#)
- [Full Author Name \[fau\]](#)
- [Full Investigator Name \[fir\]](#)
- [Grants and Funding \[gr\]](#)
- [Investigator \[ir\]](#)
- [ISBN \[isbn\]](#)
- [Issue \[ip\]](#)
- [Journal \[ta\]](#)
- [Language \[la\]](#)
- [Last Author Name \[lastau\]](#)
- [Location ID \[lid\]](#)
- [MeSH Date \[mhda\]](#)
- [MeSH Major Topic \[majr\]](#)
- [MeSH Subheadings \[sh\]](#)
- [MeSH Terms \[mh\]](#)
- [Modification Date \[lr\]](#)
- [NLM Unique ID \[jid\]](#)
- [Other Term \[ot\]](#)
- [Owner](#)
- [Pagination \[pg\]](#)
- [Personal Name as Subject \[ps\]](#)
- [Pharmacological Action \[pa\]](#)
- [Place of Publication \[pl\]](#)
- [PMCID and MID](#)
- [PMID \[pmid\]](#)
- [Publication Date \[dp\]](#)
- [Publication Type \[pt\]](#)
- [Publisher \[pubn\]](#)
- [Secondary Source ID \[si\]](#)
- [Subset \[sb\]](#)
- [Supplementary Concept \[nm\]](#)

[Text Words \[tw\]](#)

- [Title \[ti\]](#)
- [Title/Abstract \[tiab\]](#)
- [Transliterated Title \[tt\]](#)
- [Volume \[vi\]](#)

Proximity searching

You can use proximity searching to search for multiple terms appearing in any order within a specified distance of one another in the [Title], [Title/Abstract], or [Affiliation] fields.

To create a proximity search in PubMed, enter your terms using the following format:

"search terms"[field:~N]

- **Search terms** = Two or more words enclosed in double quotes.
 - There is no limit to the number of words you can search together in proximity; however, the more terms you enter, the more restrictive your search becomes. Using the [Boolean operator](#) AND to combine terms may be more appropriate than combining many terms into one proximity search.
- **Field** = The search field tag for [Title], [Title/Abstract], or [Affiliation] fields.
 - Proximity searching is only available in the [Title](#), [Title/Abstract](#), and [Affiliation](#) search fields.
 - You can use the full search field tags [Title], [Title/Abstract], and [Affiliation], or the abbreviated versions [ti], [tiab], and [ad].
- **N** = The maximum number of words appearing between your search terms.
 - What N value to use will depend on your search. Try changing the N value and comparing the results to find what works best for your search.
 - A higher N creates a broader, more comprehensive search; this will typically retrieve more results overall, but some of these results may be less relevant. Using the [Boolean operator](#) AND to combine terms may be more appropriate than proximity searching with a large N value.
 - A lower N creates a narrower, more precise search; this will typically retrieve fewer results that are highly relevant, but may exclude other relevant results.
 - If N=0, the quoted terms will appear next to each other--with no other words in between.
 - For the affiliation field only, an N value of 1,000 or less will search for the double quoted terms together within the same affiliation, rather than spread across all affiliations on the record. See [Affiliation \[ad\] for an example proximity search in the affiliation field](#) and more information about searching for affiliations.

More information about proximity searching:

- Results will include your quoted terms in any order. If you would like to search for an exact phrase with terms appearing in a specific order, use a phrase search instead.
- Automatic Term Mapping is not applied to the quoted terms.
- Proximity searching is not compatible with [wildcards](#) (*). If the double quoted terms in a proximity search include a wildcard (*), the proximity operator will be ignored.
- You can combine proximity searches with other terms using Boolean operators; for example, "hip pain"[Title:~4] AND stretching
- Booleans and [stopwords](#) included in quoted terms for proximity search are searched like regular keywords.

Example

Search PubMed for citations with the terms "rationing" and "healthcare" appearing within 2 words of each other--in any order--in the Title field:

["rationing healthcare"\[Title:~2\]](#)

Search results may include: rationing healthcare, healthcare rationing, rationing of healthcare, rationing in healthcare, rationing universal healthcare, rationing strategies in healthcare, rationing limited healthcare... and more.

Example

Search PubMed for citations with the terms "patient," "physician," and "relationship" appearing next to each other—in any order—in the Title/Abstract fields:

["patient physician relationship"\[Title/Abstract:~0\]](#)

Since N=0, the quoted terms must appear next to each other with no other words in between them, although they can still appear in any order.

Example

You can build queries that combine proximity searches with other terms using Boolean operators (AND, OR, NOT):

["accidental overdose"\[Title/Abstract:~3\] AND acetaminophen "patient physician relationship"\[tiab:~0\] OR "patient doctor relationship"\[tiab:~0\]](#)

Display, Sort, and Navigate

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- [Display an abstract](#)
- [Changing the display format of search results](#)
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Understanding your search results

Citations are initially displayed 10 items per page and sorted by Best Match.

By default, PubMed search results are displayed in a summary format and include snippets from the citation abstract. Snippets and highlighted terms are selected based on relatedness to your query.

To see the abstract for an individual citation, click the title of the citation to go to its abstract page.

Journal names are shown using the journal title abbreviation. When viewing citations in Abstract format, you can mouseover a journal's title abbreviation to display the full journal name.

Display an abstract

Click the title of the citation to go to its abstract page, or change the search results display to Abstract format using the Display options button in the upper right corner of the search results page.

PubMed may include non-English abstracts if supplied by the publisher. The abstract text defaults to English when a citation has an accompanying non-English abstract. Links to display the additional language(s) are available on the Abstract display. To retrieve citations with non-English abstracts, use the query `hasnonenglishabstract`.

Changing the display format of search results

Results are displayed in the summary format by default, except a single citation result will go directly to the abstract page. You can change the results format using the Display options button:

1. Click the Display options button in the upper right corner of the search results page
2. Select the display format you would like to use
3. Results will be displayed in the new format

Selecting one or more items and changing the display format will display only the selected result(s) in the new format.

By default, the summary format includes snippets from the citation abstract. You can turn off snippets under Display options by deselecting Abstract snippets.

Showing more results

The results page indicates the total number of items retrieved.

Ten items are displayed per page by default. You can change the number of items displayed per page using the Display options button:

1. Click the Display options button in the upper right corner of the search results page
2. Select the number of items to display per page: 10, 20, 50, 100, or 200
3. Your selection will be active for subsequent searches until your browser cookies are cleared.

Click "Show more" to display the next page of results, or click "Jump to page" to navigate directly to a specific page of results.

Sorting your results

The default sort order in PubMed is Best Match. You can use the "Sort by" drop-down menu at the top of the search results page to change the sort order.

If you change the sort order, your new selection will be active for subsequent searches until your browser cookies are cleared.

Sort orders

You can sort your search results by:

- **Best Match:** The Best Match sort order is based on an algorithm that analyzes each PubMed citation found with your search terms. For each search query, "weight" is calculated for citations depending on how many search terms are found and in which fields they are found. In addition, recently-published articles are given a somewhat higher weight for sorting. The top articles returned by the weighted term frequency algorithm above are then re-ranked for better relevance by a new machine-learning algorithm. Please see the [Algorithm for finding best matching citations in PubMed](#) for more information.
- **Most Recent:** Citations sorted by Most Recent are displayed in reverse date added order: last in, first out. The Most Recent date is the date a record was initially added to PubMed, not the publication date. The secondary sort

is PMID.

- **Publication Date:** Citations sorted by Publication Date are displayed in reverse chronological order: newest to oldest. Citations with more than one publication date, such as electronic and print, are sorted by their earliest publication date. Publication dates without a month are set to January, multiple months (e.g., Oct-Dec) are set to the first month, and dates without a day are set to the first day of the month. Dates with a season are set as: winter = January, spring = April, summer = July and fall = October.
- **First Author:** Citations are sorted alphabetically by first author name. The secondary sort order within a group with the same first author is PMID.
- **Journal:** Citations are sorted alphabetically by journal name. The secondary sort order within a group with the same journal name is PMID.

Reverse sort order

- When sorting by Most Recent, Publication Date, First Author, or Journal, you can reverse the sort order by clicking the up/down arrow next to the selected sort option to toggle between ascending or descending order.
- The reverse sort option will not display when Best Match sort order is selected.

Computed author sort

Clicking an author name link on the abstract display runs a search for the author in PubMed. If an author name is computationally similar with an author name for additional PubMed citations, the results will display those citations first, in ranked order, followed by the non-similar citations. Author name disambiguation details are available in [Liu W and Wilbur WJ](#).

Finding the full text article

PubMed records contain citation information (e.g., title, authors, journal, publication date) and abstracts of published articles and books. PubMed search results do not include the full text of the journal article, but the abstract view in PubMed includes links to the full text from other sources when available, such as the publisher's website or the [PubMed Central \(PMC\)](#) database. The full text journal site may require a fee or subscription, however online journals sometimes provide free access. Access may also be available through your organization, or local medical library.

You may be able to obtain free copies of full text articles in these ways:

Free full text filter

On the filter sidebar, click "Free full text" to narrow results to resources that are available for free on the web, including PubMed Central, Bookshelf, and publishers' websites. Alternately, include free full text[Filter] in your query.

PubMed Central

When full text is available in [PubMed Central \(PMC\)](#), the "Free in PMC" icon will appear on the citation's abstract display under Full Text Links. Click the icon to view the article in PMC.

PubMed Central (PMC) is the U.S. National Institutes of Health (NIH) free digital archive of biomedical and life sciences journal literature.

From the publisher

Journal publishers or related organizations may provide access to articles for free, for free after registering as an individual or guest, or for a fee. When provided by the publisher or other organization, icons linking to these sources can be found on the citation's abstract display under the "Full Text Links" and/or "LinkOut" sections. Icons will often

indicate free full text when the article is available for free.

Note: When you click a full text icon or link in PubMed, you leave PubMed and are directed to the full text at an external provider's site. NCBI does not hold the copyright to this material, and cannot give permission for its use. Users should review all copyright restrictions set forth by the full text provider before reproducing, redistributing, or making commercial use of material accessed through LinkOut.

Please see the [Copyright and Disclaimers](#) page for additional information.

If you are affiliated with a hospital, university, or other institution

Your local medical library is your best option. If you see icons for your library on the abstract view this indicates that your library provides a link to the article, has the journal in its collection, or may otherwise obtain the article for you through interlibrary loan. If your library does not have access to the article you need, ask a librarian about ordering the article from another institution.

Local library

Some local libraries have copies of medical journals or can get a copy of an article for you. Ask your local librarian about inter-library loan options and fees.

Figures

PubMed abstracts include figures when the full text article is available in [PubMed Central \(PMC\)](#). Click the thumbnail to view a larger version of the image, caption, and link to the figure and copyright information in PMC. Figures correspond to the article version archived in PMC, which in some cases may be the [Author Manuscript](#) version.

Similar articles

The abstract page for a citation includes links to PubMed citations for similar articles. The "See all similar articles" link will retrieve a pre-calculated set of PubMed citations that are closely related to the selected article:

- Similar articles are displayed in ranked order from most to least relevant, with the "linked from" citation displayed first.
- Similar articles are generated by comparing words from the title, abstract, and MeSH terms using a word-weighted algorithm.
- Filters are not activated for similar articles.
- You can refine the list of similar articles using your search [History](#), where the similar articles retrieval is represented as a list of PMIDs. Use this search number in a search. Refining the list removes the ranked order and may remove citations that are most relevant.

See [Computation of similar articles](#) for more information.

Cited by

PubMed abstracts include links to other publications citing the current item. For items with more than 5 citing publications linked in PubMed, a "See all 'cited by' articles" link will retrieve the list of citing publications with the cited article displayed as the first result.

"Cited by" is generated using data submitted by publishers and from NCBI resources, when available. "Cited by" may not be a complete list of works citing a particular item.

References

PubMed abstracts include references when available. Reference lists are available for citations to full text articles included in the open access subset of PMC and for citations where the publisher supplied references in the citation data sent to PubMed.

Grants and funding

PubMed displays grant numbers, contract numbers, and intramural research identifiers that have been associated with a publication by:

1. Publishers when depositing data in PubMed and PubMed Central;
2. An author, principal investigator, or project director when:
 - depositing a manuscript through the [NIH Manuscript Submission \(NIHMS\)](#) or [Europe PMC Plus](#) system; or
 - when adding a publication to [My Bibliography](#); and/or
3. NLM text mining and indexing processes.

A grant award or contract may be acknowledged in an article and, therefore, displayed in PubMed, for various reasons, including support for activities that contributed directly to the publication as well as support for the generation of an underlying dataset or another shared resource. Additionally, some articles may not explicitly acknowledge intramural research support, yet the authors may be affiliated with a funding agency and may have associated their intramural support with a PubMed record at the time of manuscript deposit to PMC.

Funding information in PubMed is collected in or converted to a [standardized format](#) when possible to enable broad discovery and impact monitoring. For example, if a publication acknowledges support from NIH grant number 1R01 GM987654-01-A1 or GM987654 or ROI GM987654 in a publication, in PubMed the funding information would be normalized to R01 GM987654, consistent with [NIH requirements](#) for proper grant number format. Funding associations made in a manuscript submission, grant reporting, or indexing system use standardized project identifiers provided to NLM by the organization administering the funding. To learn about searching funding information, see the search field section on [Grants and funding \[gr\]](#).

The scope of funding information included in PubMed has expanded over time to support the public access policies of [NIH and other funding organizations](#). Since 1981, NLM has included grant or contract numbers or both that designate financial support by any agency of the United States Public Health Service (PHS), including NIH. Until 2000, only up to three grant numbers were included. Beginning in March 2006, funding information was expanded in PubMed to include grant, contract, and intramural funding assertions made in NIHMS and My Bibliography to support the NIH Public Access Policy. Publishers have been able to supply funding information directly to PubMed since January 2017.

Reporting funding information errors

Some publications may be inadvertently linked to the wrong funding information. For example, the association of a publication to NIH-funded extramural research requires that the author(s) acknowledge NIH support in the article and that the acknowledgement be in a form that can be readily associated with a specific grant or contract. Variations in the format used to cite NIH funding may lead to either an inability to make an association or erroneous matches of publications to grants and contracts.

If you identify an error in funding information associated with a PubMed record, please contact the [NLM help desk](#). NLM will not remove funding associations that reflect the acknowledged funding in the article without a published correction to ensure alignment with the scientific record. If an award association was provided by the author, principal investigator, or project director in My Bibliography or the NIHMS for formal NIH progress and public access compliance reporting, removing the association requires the principal investigator be notified and confirm the lack of direct support.

Navigating searches with more than 10,000 results

PubMed can display up to 10,000 results. The following options can help you navigate searches with more than 10,000 results:

- [Reverse the sort order](#) to see the last results first.
- Divide the result set into smaller chunks using the [results timeline](#) or [custom date range filter](#).
- [Adjust your search](#) to retrieve fewer results.
- For programmatic use and bulk downloads, [PubMed data is available via FTP](#).

Discovering related data in NCBI databases

When available, links to other related NCBI databases are included on a citation's Abstract page under the Related information section. The complete list of database options is provided in [Entrez Link Descriptions](#).

MEDLINE indexed citations include additional supplemental information on the Abstract page such as MeSH terms, publication types, and substances with links to search for these data in PubMed and the MeSH Database.

To simultaneously search all NCBI databases, use the [NCBI Search page](#).

Find related resources using LinkOut

Most PubMed records include [LinkOut](#) resources to a variety of websites including publishers, aggregators, libraries, biological databases, and sequence centers. LinkOut resources link to providers' sites to obtain the full text of articles or related information, e.g., consumer health. There may be a charge to access the text or information from a provider's site.

To view LinkOut resources, navigate to the LinkOut section at the end of an individual citation's abstract page.

To find citations with links to free full text articles, apply the "Free full text" filter to your search results.

To find citations with links to full text articles, enter search terms followed by AND full text[*sb*].

More information about Links:

- LinkOut resource categories such as "free full text" have been selected by the LinkOut provider.
- The current list of [LinkOut providers](#) is available.
- A publisher's icon link may display on the abstract format if they have electronically provided their citation data to NCBI. Links are only available for publishers that are participating in LinkOut; publishers are responsible for providing working links.

Reporting broken or problem links

LinkOut links are supplied by the LinkOut providers. Publishers who electronically supply their data to PubMed may include an icon that links to a site providing the full text. Corrections and changes to links are made by the providers and are their responsibility.

To report problem links or inquire about online journal subscriptions, contact the provider directly. Contact information is typically available at a provider's web site.

Cite, Save, and Share

- [Save citations temporarily using the Clipboard](#)

- [Save citations indefinitely using My NCBI Collections](#)
- [Save citations as a text file](#)
- [Cite an article](#)
- [Export citations into citation management software](#)
- [Email citations](#)
- [Create an email alert for a search](#)
- [Create an RSS feed for a search](#)
- [Print your search results](#)
- [Get a permalink to bookmark or share your search](#)
- [Download PubMed data](#)

Save citations temporarily using the Clipboard

The Clipboard provides a place to collect up to 500 items from one or more searches. Items saved to the Clipboard are stored in your browser cookies and will expire after 8 hours of inactivity. If you would like to save items for longer than 8 hours or to view on another device, please use [Send to: Collections](#).

To add items to the Clipboard:

1. Use the check boxes to select items from your search results. To save all results (up to a maximum of 500), do not tick any check boxes.
2. Use the Send to button and choose Clipboard.
3. Selected items will be added to the Clipboard.
 - If no items were selected, a drop-down menu of options will display where you may add selected items, all results on the page, or all results (up to a maximum limit of 500 citations) to the Clipboard.
 - An individual item can also be added to the Clipboard from its abstract page.
4. To view your selections, click the Clipboard link under the Search bar. This link will only appear after one or more items have been added to the Clipboard; the link is not present when the Clipboard is empty.

To delete items from the Clipboard:

- On the Clipboard page, click "Remove from Clipboard" below each item to delete the item from the Clipboard.
- Select one or more items using the check boxes next to each item, then click "Remove selected items."
- To delete all items from the Clipboard, click "Remove all."

More information about the Clipboard:

- Citations added to the Clipboard are marked with the message "Item in Clipboard" in search results.
- The maximum number of items that can be sent to the Clipboard is 500. If you select Clipboard from send to without selecting citations, PubMed will add all (up to 500 citations) of your search results to the Clipboard.
- The Clipboard will not add a citation that is currently in the Clipboard; it will not create duplicate entries.
- Your web browser must accept [cookies](#) to use the Clipboard.
- Citations in the Clipboard are represented by the search number #0, which may be used in Boolean search statements. For example, to limit the citations you have collected in the Clipboard to English language articles, use the following search: #0 AND english [la]. This does not affect or replace the Clipboard contents.

Save citations indefinitely using My NCBI Collections

Search results can be saved in My NCBI using the [Collections](#) feature. There is no limit to the number of collections you may store in My NCBI. In addition, collections can be made public to share with others.

To save results to a new collection:

1. Sign into My NCBI. Run a search in PubMed.

2. Use the check boxes to select items from your search results or Clipboard. To save all results (up to a maximum of 1,000), do not tick any check boxes.
3. Use the Send to button and choose Collections.
4. Selected items will be added to a Collection.
 - If no items were selected, a drop-down menu of options will display where you may add selected items, all results on the page, or all results (up to a maximum limit of 1,000 citations) to a Collection.
 - An individual item can also be added to a Collection from its abstract page.
5. Choose Create a new collection.
6. Name your collection using a short, meaningful title. The name must be unique and less than 100 characters. Identical names for different Collections are not allowed.
7. Click Add to finish.

As you continue to build collections, you may want to add new items to an existing collection. To add search results to an existing collection:

1. Follow steps 1 - 4 above. Add to an existing collection will be the default selection.
2. Use the pull-down menu to choose a collection.
3. Click Add to finish.

For more information on viewing, sorting, editing, merging, sharing, and deleting collections, see [Collections](#) in My NCBI Help.

Save citations as a text file

Use the Save button to download citations to a text file.

1. Use the check boxes to select citations from your search results or Clipboard. You may move to other pages to continue your selections. If you do not make any selections, you can choose to save “All results on this page” or “All results” from the Save menu.
2. Click Save and choose a Selection and Format from the menu that appears.
 - Selection: The citations you would like to save.
 - Selection: The number of selected items will be shown, for example: Selection (87).
 - All results on this page
 - All results (up to a maximum of 10,000 citations)
 - Format: Summary (text), [PubMed](#), PMID list, Abstract (text), or CSV
3. Click Create file.
4. Your web browser will prompt you to save the file on your computer.

More information about saving citations to a file:

- Saving a large set of results may take several minutes.
- To save citations in HTML format, use the "Save" or "Save as" function of your browser and change the file extension to html. When saving as HTML, only those citations displayed on the page will be saved; therefore, consider [showing more results](#).

Cite an article

The Cite button makes it easy to retrieve styled citations that you can copy and paste into a document, or download an .nbib file to use with your reference manager software.

Using the Cite button for an item will open a pop-up window where you can copy the citation formatted in four popular styles: AMA (American Medical Association), MLA (Modern Language Association), APA (American Psychological Association), or NLM (National Library of Medicine). You can also download the citation as an .nbib file, which most bibliographic reference management software can import.

Note: In all citation styles, there are certain capitalization rules that machines cannot handle. For example, there is no way to identify proper nouns, acronyms, abbreviations, etc., that is 100% accurate and complies with all rules at all times. Capitalization of article titles and other citation elements should be checked for compliance with a particular reference style when required.

To export multiple citations: follow the instructions for [saving citations as a text file](#) and choose the format Summary (text) to save a list of citations in NLM style, or follow the instructions to [export citations into your citation management software program](#).

Export citations into citation management software

Use Send to: Citation Manager to export citations as an .nbib file that can be used by many citation management programs:

1. Use the check boxes to select citations from your search results or Clipboard. You may move to other pages to continue your selections. Alternately, you can choose to save all results on this page or all results from the Send to: Citation Manager menu.
2. Click Send to and choose Citation Manager.
3. Confirm the citations you want to export: selection, all results on this page, or all results (up to a maximum of 10,000).
4. Click Create file.
5. Your web browser will prompt you to save the file on your computer.
6. Import this saved file into your citation management program.

You can also download an .nbib file for individual citations using the Cite button.

Questions regarding citation management software should be directed to the respective companies.

Email citations

1. Use the check boxes to select citations from your search results or Clipboard. You may move to other pages and continue your selections. You may also choose to email all citations shown on the page without making any selections.
2. Click the Email button.
3. Enter an email address. Select which citations to send and the format.
4. Click Send email. The system returns you to your results page and displays a confirmation e-mail sent message.

More information about emailing citations:

- Your citations will be sent from the NCBI automatic mail server with the sender's email address [nobody@ncbi.nlm.nih.gov]. Do not reply to this message, as this is not a functioning customer service email address and is not monitored.
- The CAPTCHA image does not display for users who are signed in to My NCBI.

Create an email alert for a search

Click "Create alert" under the search bar to create an automatic email update for searches. You must sign in to My NCBI to use this feature. See [Saving and Managing Searches](#) for more information.

Create an RSS feed for a search

Click on Create RSS under the search box at the top of the page to create an RSS feed for your search.

1. The RSS feed name will default to the search terms. You can edit the RSS feed name as needed.
2. Use the pull-down menu to select the number of items displayed. You may manually edit the limit= parameter in the RSS feed link created in Step 4 to display up to a maximum of 1000 items. Please note that increasing this limit will also increase the loading time.
3. Click the Create RSS button.
4. The RSS Feed Link will appear; click on Copy to copy the link.
5. Use this link with your feed reader or other application.

Print your search results

Use the print function of your web browser. To print citations from different searches, save the citations in [PubMed's Clipboard](#), and then print.

See also:

- [Showing more results](#)
- [Changing the display format](#)

Get a permalink to bookmark or share your search

To get the URL for an individual citation:

- From an abstract page, click the Permalink button on the right sidebar and click "Copy".
- From the search results, right click an article title and choose the copy link option; exact wording and functionality may change depending on your operating system and browser.
- From a mobile device, use your device's native share functionality to copy a link.

To get the URL for your search results, copy the URL from your web browser's address bar or bookmark the URL using your web browser's bookmark function.

To create a URL manually:

1. Use the base URL: <https://pubmed.ncbi.nlm.nih.gov/?term=search>
2. Replace "search" in the base URL with your query terms
3. Escape spaces by converting them to plus signs (+); for example, Biochem Soc Trans should be entered as: Biochem+Soc+Trans

The number of characters you can use may be limited by your browser's maximum URL length (which may be different for each browser).

Example

Search PubMed for articles about antioxidant and chocolate:

<https://pubmed.ncbi.nlm.nih.gov/?term=antioxidant+chocolate>

Optional search parameters:

- format=summary, abstract, pubmed, pmid
- sort=relevance, date, pubdate, fauth, jour
- sort_order=asc
- size=10, 20, 50, 100, 200

Example

Search PubMed for articles about breast cancer, sorted by ascending publication date (oldest to newest), and display 50 citations per page:

https://pubmed.ncbi.nlm.nih.gov/?term=breast+cancer&sort=pubdate&sort_order=asc&size=50

More information about PubMed links:

- Some settings in PubMed rely on cookies and other session data that may not be present in the URL. For example, searches that were created using a search number in Advanced History (e.g., #1 OR #2 AND human[mh]) cannot be saved using the URL because the search will be lost when your History expires.
- Users intending to send frequent queries or retrieve large numbers of records from the NCBI databases should use [E-Utilities](#). Users must comply with the [usage guidelines and requirements](#) to prevent overloading NCBI systems.
- The [NCBI Disclaimer and Copyright](#) notice must be evident to users. Users are advised to consult legal counsel to ensure compliance with intellectual property laws. NLM cannot provide advice about copyright issues.

Download PubMed data

Once a year, NLM releases a complete (baseline) set of PubMed citation records in XML format for download from our FTP servers. Incremental update files are released daily and include new, revised, and deleted citations. The PubMed DTD states any changes to the structure and allowed elements from year to year.

Note: Binary mode must be used when downloading data from our FTP servers.

- Documentation: [PubMed XML Elements and Attributes](#)
- [Terms and Conditions](#)
- [PubMed Baseline](#)
- [PubMed Update Files](#)
- [PubMed DTD](#)

For more information, please see [Download PubMed Data](#).

Advanced Search

- [Searching in a specific field](#)
- [Browsing the index of terms](#)
- [History](#)
- [Previewing the number of search results](#)
- [Combining searches using History](#)
- [Viewing the Search Details](#)

Tools included on the [Advanced Search](#) page help users to: search for terms in a specific field, combine searches and build large, complex search strings, see how each query was translated by PubMed, and compare number of results for different queries.

Searching in a specific field

Use the Advanced Search Builder to search for terms in a specific field, such as author or journal. For some fields, an autocomplete feature will provide suggestions as you type.

1. From the "All Fields" drop-down menu, select the field you would like to search.
2. Add terms from the builder to the query box to construct your search. The default Boolean operator is AND; if desired, choose OR or NOT from the pull-down menu.
3. Once you have finished adding terms to the query box, click Search (or Add to History) to run the search.

You may also search a specific field -- and bypass [Automatic Term Mapping](#) -- by adding a [search field tag](#) to a term.

Browsing the index of terms

The Advanced Search Builder includes the Show Index feature, which provides an alphabetical display of terms appearing in selected PubMed search fields. You can browse by all fields or within specific fields such as MeSH Terms.

1. Click Advanced to navigate to the [Advanced Search](#) page, and use the Builder to select a search field from the All Fields menu. Note: Show Index is not available for every search field. The Show Index link will only display for fields that are compatible with this feature.
2. Enter a term in the search box, then click Show Index.
3. The index displays an alphabetic list of search terms and the approximate number of citations for each term (the actual citation count is returned when the search is executed).
4. Scroll until you find a term you want to include in your search, and then highlight it to add it to the search box.
5. Multiple terms may be selected from the list and added to the search box.
6. Add terms from the builder to the query box to construct your search.
7. Once you have finished adding terms to the query box, click Search (or Add to History) to run the search.

More information about using the index:

- PubMed processes all Boolean operators left to right.
- The builder will automatically OR (and add parentheses) for multiple terms selected from the index.
- A slash will display after a space. For example, the MeSH Term and Subheading "zika virus/analysis" will display after "zika virus infection/virology." Enter MeSH terms followed by a slash to go directly to the display for the MeSH/Subheading combination counts in the index.
- Show Index is not available for date fields.

History

Your PubMed search history appears on the [Advanced Search](#) page under History. This feature requires your web browser to accept cookies.

Descriptions of each column in the History table appear below:

- Search: Searches are numbered in chronological order.
 - Search numbers may be used in place of the search string itself when combining queries (e.g., #1 OR #2).
 - A repeated query will move to the top of History but will retain its original numbering.
 - History is limited to the last 100 searches. Once the maximum number is reached, PubMed will remove the oldest search from history and add the most current search.
- Actions: Add, delete, or save a query. Adding queries from History places the search string into the Query box to be used in the next search. Deleting a query removes it from History.
- Query: This column shows previous search strings as entered by the user.
- Details: PubMed may modify or add search terms to a search to optimize retrieval, e.g., using automatic term mapping. Click the chevron icon ">" to expand search details and see how the search was translated.
- Results: The total number of citations retrieved for that query. Click the number to run the search and see the results in PubMed.
- Time: Timestamp of when the search was conducted.
- Download: Click Download to generate a CSV file of current History items.
 - Please note, Microsoft Excel is typically unable to display or print more than a maximum of 1024 characters in a cell; therefore, you may want to open the CSV file with a text editor to display your complete searches.
- Delete: Click "Delete" to remove all queries from History; otherwise, History expires after 8 hours of inactivity.

Previewing the number of search results

1. Click Advanced to navigate to the [Advanced Search](#) page.
2. Use the builder to add search terms to the query box, or type your search directly into the query box.
3. Use the split button to toggle the button function from "Search" to "Add to History".
4. Click Add to History. This will run the search without leaving the Advanced Search page.
5. See your query including the number of results in the History table.

Combining searches using History

Searches can be combined or used in later searches using your search History.

1. Click Advanced to navigate to the [Advanced Search](#) page.
2. In the History table, click the More Actions icon " ..." next to your query.
3. From the available options, select "Add query" to copy the query to the Query box.
4. After you've added content to the Query box, options to use the Boolean operators AND, OR, or NOT will appear when adding more queries to the Query box.
5. Edit your query in the Query box if you would like to make any changes before running the search.
6. Click Search (or Add to History).

More information about combining searches from your History:

- Search numbers may be used in place of the search string itself when combining queries (e.g., #1 OR #2).
- Citations in the Clipboard are represented by the search number #0, which may be used in searches. For example, to limit the citations you have collected in the clipboard to English language citations, use the following search: #0 AND english [la]. This does not change or replace the Clipboard contents.

Viewing the Search Details

PubMed may modify or add additional search terms to your search to optimize retrieval, such as: MeSH terms, British/American spellings, singular/plural word forms, and other synonyms.

1. Search Details are included on the [Advanced Search](#) page under History.
2. Click the chevron icon ">" next to a query in History to expand the Search Details.
3. When expanded, the details below a query in the History table show the search strategy used to run the search.

More information about search details:

- Translations show individual term mappings using PubMed's search rules and syntax. Query terms without translations will not be listed in this section; for example, [exact phrases](#) bypass [Automatic Term Mapping \(ATM\)](#).
- Warnings are displayed for the original query with potential errors in bold and red type, such as syntax errors, terms not found, or invalid tags. Warnings also appear as a highlighted message in PubMed when the search is run or added to History.

Other services

- [Clinical Queries](#)
- [Single Citation Matcher](#)
- [Search PubMed using the MeSH database](#)
- [Search for journal information in the NLM Catalog](#)
- [Using the E-utilities API tools](#)
- [Citation Matcher API](#)
- [Batch Citation Matcher](#)

- [Consumer health](#)

Clinical Queries

[PubMed Clinical Queries](#) provides specialized searches for:

- [COVID-19 Articles](#)
- [Clinical Study Categories](#)
- [Medical Genetics](#)

Search for COVID-19 articles

The COVID-19 article filters limit retrieval to citations about the 2019 novel coronavirus. Results are displayed in a column filtered by research topic categories. See [COVID-19 article filters](#) for the filter search strategies; these may evolve over time.

To find citations using the COVID-19 article filters:

1. Click Clinical Queries from the PubMed homepage
2. Enter your search terms in the search box
3. Click Search
4. Select a Category: General, Mechanism, Transmission, Diagnosis, Treatment, Prevention, Case Report, Forecasting, or Long COVID
5. Preview results in the COVID-19 Articles column
6. To view the results in PubMed, click the "See all" link below the results preview

To use the COVID-19 article filters in a query, add the filter name to your search with the search field tag [Filter], e.g., LitCPrevention[Filter]. The available filters are:

- LitCGeneral
- LitCMechanism
- LitCTransmission
- LitCDiagnosis
- LitCTreatment
- LitCPrevention
- LitCCaseReport
- LitCForecasting
- LitCLongCOVID

Example

Search PubMed for Remdesivir with the COVID-19 General filter:

[Remdesivir AND LitCGeneral\[Filter\]](#)

Search by clinical study category

Clinical Study Categories use a specialized search method with built-in search filters that limit retrieval to citations reporting research conducted with specific methodologies, including those that report applied clinical research. See [Clinical Study Categories filters](#) for the filter search strategies.

To find citations using the Clinical Study Categories:

1. Click Clinical Queries from the PubMed homepage

2. Enter your search terms in the search box
3. Click Search
4. Select a Category: Therapy, Diagnosis, Etiology, Prognosis, or Clinical Prediction Guides
5. Select a Scope: Narrow (specific search) or Broad (sensitive search)
6. Preview results in the Clinical Study Categories column
7. To view the results in PubMed, click the "See all" link below the results preview

Medical genetics searches

The Medical Genetics filters limit retrieval to citations related to various topics in medical genetics. See [Medical genetics search filters](#) for the filter search strategies.

To use a Medical Genetics filter, add the filter name to your search with the search field tag [Filter], e.g., Genetic Testing[Filter]. The available filters are:

- Diagnosis
- Differential Diagnosis
- Clinical Description
- Management
- Genetic Counseling
- Molecular Genetics
- Genetic Testing
- Medical Genetics

Example

Search PubMed for sickle cell anemia using the Genetic Counseling filter:

[sickle cell anemia AND genetic counseling\[Filter\]](#)

Single Citation Matcher

The [Single Citation Matcher](#) has a fill-in-the-blank form for searching for a citation when you have some bibliographic information, such as journal name, volume, or page number.

- Click Single Citation Matcher on the PubMed homepage.
- Enter the citation information.
- Click Go.

More information about using the Single Citation Matcher:

- The journal box includes an autocomplete feature that suggests titles as you enter a title abbreviation or full title. Titles displayed by the autocomplete menu are in ranked order based on the number of citations in PubMed.
- After selecting a journal with special characters (e.g., ampersand, colon) when using the Back button to return to the Single Citation Matcher you must clear and reenter the title.
- The author box also includes an autocomplete feature that suggests author names in ranked order based on the number of citations. Full author names may be searched for citations published from 2002 forward if the full author name is available in the article.
- Click either the 'Only as first author' or 'Only as last author' check box to limit an author name to the first or last author.

Search PubMed using the MeSH database

[MeSH](#) (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing PubMed citations.

Use the [MeSH database](#) to find MeSH terms, including Subheadings, Publication Types, Supplementary Concepts and Pharmacological Actions, and then build a PubMed search. The MeSH database can be searched by MeSH term, MeSH Entry Term, Subheading, Publication Type, Supplementary Concept, or MeSH Scope Note.

More information about the MeSH database:

- An autocomplete feature is available from the search box.
- Search results are displayed in relevance-ranked order, therefore, when a user's search exactly matches a MeSH Term, that Term is displayed first.
- Click the MeSH term from the Summary display or choose Full from the display format menu to view additional information and search specifications, such as Subheadings, restrict to Major MeSH Topic, or exclude terms below the term in the MeSH hierarchy.
- Year Introduced is the year the term was added to MeSH. If more than one year is shown, the term was available for indexing back to the earliest year noted. Articles are indexed using the vocabulary in place at the time of indexing, therefore, the year introduced for a term and the date of publication of a citation indexed with that term may not agree.

Launch PubMed searches from the MeSH database

To build a PubMed search from MeSH:

1. Run a search in the [MeSH database](#).
2. Select terms using the check boxes.
3. Click "Add to search builder" in the PubMed search builder portlet.
4. You may continue searching and including additional terms to the PubMed search builder using the "Add to search builder" and Boolean pull-down menu.
5. When you are finished, click "Search PubMed."

Search for journal information in the NLM Catalog

The [NLM Catalog](#) includes information about the journals in PubMed and the other NCBI databases.

Click [Journals in NCBI Databases](#) on the homepage of NLM Catalog or the [Journals](#) link on the PubMed homepage to limit your NLM Catalog results to the subset of journals that are referenced in NCBI database records.

See the [NLM Catalog help](#) for additional information.

Other journal resources include:

- PubMed journals with [links to full text](#)
- List of [all journals included in PubMed via FTP](#)
- [List of Serials](#) Indexed for Online Users

Using the E-utilities API tools

[E-utilities](#) are tools that provide access to data outside of the regular NCBI web search interface. This may be helpful for retrieving search results for use in another environment. If you are interested in large-scale data mining on PubMed data, you may download the data for free from our [FTP server](#). Please see the [terms and conditions](#) for data users.

Citation Matcher API

- [API root](#)

[Fielded search](#)

- [Heuristic search](#)
- [Auto search](#)
- [Rate control](#)

The PubMed Citation Matcher API finds PubMed identifiers (PMIDs) for citation data in structured or raw form. The interface supports three retrieval methods:

1. `field` - runs a fielded search using core bibliographic information, such as journal, date, or volume.
2. `heuristic` - collects all input elements into a single string and returns the closest matching documents.
3. `auto` - combines the two above methods and switches to heuristic mode if the fielded search has not yielded a result. This is the default method.

More information about the Citation Matcher API:

- The API supports both GET and POST requests.
- Data is exchanged in JSON.
- Input data should be UTF-8 encoded.
- The API returns a maximum of 20 PMIDs; queries returning more than 20 PMIDs are treated as bad requests.

API root

The API root is:

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/>

Fielded search

`method=field` runs a fielded search using core bibliographic information, such as journal, date, or volume. This functionality is similar to [E-utilities ESearch](#); users should select the API that best suits their needs.

For a structured search, the following fields can be used:

- `journal` - the name of the journal
- `pdat` - the publication date, in the format YYYY/MM/DD
- `volume` - the volume of the publication
- `issue` - the volume of the publication
- `authors` - one or more author names, in the format "Surname Initial" (Doe J). Optionally, the position may be specified as first, last, or auto.

Example

Example fielded search:

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/?method=field&journal=Front%20Immunol&volume=13&page=826091>

Example

GET request URL:

`/citmatch/?method=field&journal=Front+Immunol&volume=13&page=826091&authors=Ihunwo+A`

POST request data:

```
{
  "citmatch": {
    "method": "field",
```

```

    "journal": "Front Immunol",
    "volume": "13",
    "page": "826091",
    "authors": [
      {
        "name": "Ihunwo AO",
        "position": "first"
      }
    ]
  }
}

```

Response:

```

{
  "version": "1.0",
  "operation": "citmatch",
  "success": true,
  "result": {
    "count": 1,
    "type": "uids",
    "uids": [
      {"pubmed": "35251006"}
    ]
  }
}

```

Heuristic search

method=heuristic collects all input elements into a single string and returns the closest matching documents. It is sufficient to supply a raw citation string, such as: "The role of drag in insect hovering. J. Exp. Biol. 2004;207:4147–4155."

Example

Example heuristic search:

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/?method=heuristic&raw-text=Neurogenesis%20and%20Viral%20Infection.%20Front%20Immunol.%202022%20Feb%2017;13:82609>

Example**GET request URL:**

```
/citmatch/?method=heuristic&raw-text=Neurogenesis+and+Viral+Infection.+Front+Immunol.+2022+Feb+17;13:82609.
```

POST request data:

```

{
  "citmatch": {
    "method": "heuristic",
    "raw-text": {"text":
"Neurogenesis+and+Viral+Infection.+Front+Immunol.+2022+Feb+17;13:82609."}
  }
}

```

Response:

```

{
  "version": "1.0",
  "operation": "citmatch",
  "success": true,
  "result": {
    "count": 1,
    "type": "uids",
    "uids": [

```

```

    }
  ]
}
{"pubmed": "35251006"}

```

Auto search

method=auto first runs a [fielded search](#), and if no results are found, it combines the fields and runs a [heuristic search](#). This is the default method.

For a structured search, the following fields can be used:

- `journal` - the name of the journal
- `pdat` - the publication date, in the format YYYY/MM/DD
- `volume` - the volume of the publication
- `issue` - the volume of the publication
- `authors` - one or more author names, in the format "Surname Initial" (Doe J). Optionally, the position may be specified as first, last, or auto.

Example

Example auto search:

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/?method=auto&journal=Front+Immunol&volume=13&page=826091&authors=Ranganathan+S>

First, a fielded search is run but no results are found due to the specified author not appearing on the citation:

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/?method=field&journal=Front+Immunol&volume=13&page=826091&authors=Ranganathan+S>

Then it concatenates the fields and runs a heuristic search, which returns the closest matching document(s):

<https://pubmed.ncbi.nlm.nih.gov/api/citmatch/?method=heuristic&raw-text=Front+Immunol+13+826091+Ranganathan+S>

Rate control

When using the PubMed Citation Matcher API programmatically, we request that you limit your application's rate to 3 requests / sec and do not make concurrent requests to this service, even at off-peak times. Additionally, requests must contain the name of the calling project in the User-Agent HTTP header value; e.g. `Hydra/1.3.15`.

Batch Citation Matcher

Use the [Batch Citation Matcher](#) to retrieve PMIDs for multiple citations. The Batch Citation Matcher requires that you enter the bibliographic information (journal, volume, page, etc.) in a specific format.

To retrieve PubMed PMIDs:

1. Create citation strings for the items you would like to retrieve using the following format:
`journal_title|year|volume|first_page|author_name|your_key|`
Fields must be separated by a vertical bar with a final bar at the end of the string.
2. Enter your email address. Email messages may take several minutes to process and be sent to your email address.
3. Upload your citation strings as a text file (.txt) or enter each citation string on a separate line in the text box. If citation strings are entered in the text box and a file is uploaded, the results will be an aggregate of both.

4. Click search.

If a match is not found the citation string will display one of the following:

- your_key|NOT_FOUND;INVALID_JOURNAL - The journal name is not valid. See the [journal lists](#) or the [NLM Catalog](#) to find the correct journal abbreviation.
- NOT_FOUND - The journal name is valid, but the citation string did not find a match.
- AMBIGUOUS - The information provided matches more than one citation. Citation information with 3 or fewer matches include the PMIDs, and more than 3 matches include the total PMID match count. Use the [Single Citation Matcher](#) or [ESearch](#) to retrieve all citations for searched fields.

Notes:

- Text (.txt) format must be used when uploading a file.
- You may receive multiple emails for searches containing more than 2,000 citation strings.
- Enter author names without punctuation as smith jc. Initials are optional.
- Your key is any string you choose to tag the citation, it is returned unaltered.
- The journal title field may include the full journal title or the NLM title abbreviation.
- Each citation field is searched starting with the journal title until a unique match is found.
- The journal title is a required field however you may omit other fields. If you omit fields you must retain the vertical bars in the citation string. For example, if you omit the volume number 88 from the first example below it should be entered as:
proc natl acad sci u s a|1991||3248|mann bj|P32022-1|

Example input:

```
proc natl acad sci u s a|1991|88|3248|mann bj|P32022-1|
proc natl acad sci u s a|1992|89|3271|gould se|P26261-1|
proc natl acad sci u s a|1970|89|3271|smith|P26261-1|
res microbiol|1992|143|467|ivey dm|P25966-1|
science|1987|235|182|palmenberg ac|P12296-2|
eschatology|1993|12|22|public jq|C12233-2|
virology|1993|193|492|hardy me|Q02945-1|
virus genes|1992|6|393||P27423-1|
yeast|1992|8|253|sasnauskas k|P24813-1|
```

Example output:

```
proc natl acad sci u s a|1991|88|3248|mann bj|P32022-1|2014248
proc natl acad sci u s a|1992|89|3271|gould se|P26261-1|1565618
proc natl acad sci u s a|1970|89|3271|smith|P26261-1|NOT_FOUND
res microbiol|1992|143|467|ivey dm|P25966-1|1448623
science|1987|235|182|palmenberg ac|P12296-2|3026048
C12233-2|NOT_FOUND;INVALID_JOURNAL
virology|1993|193|492|hardy me|Q02945-1|8382410
virus genes|1992|6|393||P27423-1|1335631
yeast|1992|8|253|sasnauskas k|P24813-1|1514324
```

Consumer health

The National Library of Medicine cannot provide specific medical advice. NLM urges you to consult a qualified health care professional for answers to your medical questions. NLM does not have pamphlets or other materials to mail.

[MedlinePlus](#) and MedlinePlus en español are specifically designed for consumers, containing hundreds of topic pages

including NIH-written descriptive information, videos, health check tools, drug, herb and supplement info, links to Fact Sheets from other NIH Institutes, the CDC, etc., and more.

Appendices

- [Further assistance and training](#)
- [How PubMed works: Automatic Term Mapping \(ATM\)](#)
- [Algorithm for finding best matching citations in PubMed](#)
- [PubMed coverage](#)
- [PubMed format](#)
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- [Filter search strategies](#)
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- [Computation of similar articles](#)
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Further assistance and training

Contact customer support

- E-mail the [PubMed Help Desk](#)
- Call the NLM Customer service desk: 1-888-FIND-NLM (1-888-346-3656)

Other NLM publications

- [PubMed Online Training](#)
- [PubMed Trainer's Toolkit](#)
- [NLM Technical Bulletin](#)

How PubMed works: Automatic Term Mapping (ATM)

Untagged terms that are entered in the search box are matched (in this order) against a Subject translation table (including [MeSH \(Medical Subject Headings\)](#)), a Journals translation table, the Author index, and an Investigator (Collaborator) index.

When a match is found for a term or phrase in a translation table the mapping process is complete and does not continue on to the next translation table.

To see how your terms were translated, check the [Search Details](#) available on the [Advanced Search](#) page for each query under History. If you want to report a translation that does not seem accurate for your search topic, please e-mail the information to the [NLM Help Desk](#).

1. Subject translation table

The Subject Translation Table contains:

- British and American spellings
- Pairs: singular and plural word forms, synonyms, and other closely related terms
- Drug brand name to generic name translations
- [MeSH](#) terms
- The See-Reference mappings (also known as entry terms) for MeSH terms
- [MeSH Subheadings](#)
- [Publication Types](#)
- [Pharmacologic action](#) terms
- Terms derived from the [Unified Medical Language System \(UMLS\)](#) that have equivalent synonyms or lexical variants in English
- Supplementary concept (substance) names and their synonyms.

If a match is found in this translation table, the term will be searched as MeSH (that includes the MeSH term and any specific terms indented under that term in the MeSH hierarchy), and in all fields.

For example, if you enter child rearing in the search box, PubMed will translate this search to: "child rearing"[MeSH Terms] OR ("child"[All Fields] AND "rearing"[All Fields]) OR "child rearing"[All Fields]

If you enter a MeSH Term that is also a Pharmacologic Action PubMed will search the term as [MeSH Terms], [Pharmacologic Action], and [All Fields].

If you enter an entry term for a MeSH term the translation will also include an all fields search for the MeSH term associated with the entry term. For example, a search for odontalgia will translate to: "toothache"[MeSH Terms] OR "toothache"[All Fields] OR "odontalgia"[All Fields] OR "odontalgias"[All Fields] because Odontalgia is an entry term for the MeSH term toothache.

Substance name mappings do not include a mapping for individual terms in a phrase, e.g., IL-22 will not include IL[All Fields] AND 22[All Fields].

MeSH term mappings that include a standalone number or single character do not include a mapping for individual terms in a phrase, e.g., Protein C will not include Protein[All Fields] or C[All Fields].

2. Journals translation table

The Journals translation table contains the:

- full journal title
- title abbreviation
- ISSN and eISSN number.

These will automatically map to the journal abbreviation that is used to search journals in PubMed and in all fields. For example, a search for endocrine pathology will translate to: "Endocr Pathol"[Journal] OR ("endocrine"[All Fields] AND "pathology"[All Fields]) OR "endocrine pathology"[All Fields]

3. Author index

If the term is not found in the above tables, and is not a single term, PubMed checks the author index for a match. The author index includes author names and initials, as well as full author names for articles published from 2002 forward, if available.

More information about author searching:

PubMed automatically truncates a search for an author's name to account for varying initials, e.g., o'brien j retrieves o'brien ja, o'brien jb, o'brien jc jr, as well as o'brien j.

- When combining multiple authors, to avoid a match with full author names, include initials or use the [au] search tag, e.g., ryan[au] james[au]. Author names comprised of only stopwords, e.g., as a, are not searched as authors if they are part of phrase, chemical burn as a danger, unless the search only includes the author name, e.g., as a.
- Enter a full author name in natural or inverted order, e.g., julia s wong or wong julia s.
- A comma following the last name for searching is optional. For some names, however, it is necessary to distinguish which name is the last name by using the comma following the last name, e.g., james, ryan.
- Omit periods after initials and put all suffixes at the end, e.g., vollmer charles jr
- Initials and suffixes are not required, if you include a middle initial or suffix, you will only retrieve citations for articles that were published using the middle initial or suffix.
- To distinguish author initials that may match a full author name use the [fau] search tag, e.g., peterson do[fau].

4. Investigator (Collaborator) index

If the term is not found in the above tables, except for Author, and is not a single term, the investigator index is consulted for a match. The investigator (collaborator) index includes full names, if available. Enter a full investigator name in natural or inverted order, e.g., harry janey or janey harry.

5. If no match is found?

PubMed breaks apart the phrase and repeats the above automatic term mapping process until a match is found. PubMed ignores [stopwords](#) in searches.

If there is no match, the individual terms will be combined (ANDed) together and searched in all fields.

When a search includes terms that were tagged with a search field during the automatic term mapping process and retrieves zero results, the system triggers a subsequent search using "Schema: all ." "Schema: all" modifies the search by removing the automatically added search field tags, and then searches each term in all fields.

Algorithm for finding best matching citations in PubMed

The learned ranking algorithm combines over 150 signals that are helpful for finding best matching results. Most of these signals are computed from the query-document term pairs (e.g., number of term matches between the query and the document) while others are either specific to a document (e.g., publication type; publication year) or query (e.g., query length). The new ranking model was built on relevance data extracted from the anonymous and aggregated PubMed search logs over an extended period of time.

For more information about the Best Match algorithm, please see:

- Technical details in the paper [Best Match: New relevance search for PubMed](#) by Fiorini N, Canese K, Starchenko G, et al. in PLoS Biol (2018).
- NLM Technical Bulletin article: [Updated Algorithm for the PubMed Best Match Sort Order](#)

PubMed coverage

The PubMed database contains citations and abstracts to biomedical literature, facilitating searching across several NLM literature resources:

- [MEDLINE](#)
- [PubMed Central \(PMC\)](#)
- [NCBI Bookshelf](#)

For additional information, please see the NLM Fact Sheet: [Medline, PubMed, and PMC \(PubMed Central\): How are they different?](#)

PubMed includes citations to original research articles, literature reviews, case reports, letters, editorials, commentaries, and other selected publications on scientific and medical topics (see: [publication types found in PubMed](#)). Some categories of content are out of scope for PubMed, such as: book reviews, individual conference abstracts, [obituaries and in memoriam articles](#), news and announcements, and brief summaries of research articles. More examples are included in [XML Help for PubMed Data Providers: What types of articles are accepted?](#)

MEDLINE

[MEDLINE](#) contains citations to journal articles in the life sciences with a concentration on biomedicine. The MEDLINE database contains citations from the late [1940s to the present](#), with some older material.

New citations from MEDLINE journals are received electronically from publishers and appear in PubMed daily. Most citations progress to in-process, and then to indexed for MEDLINE; however, not all citations will be indexed for MEDLINE. PubMed includes some citations from MEDLINE journals that are not indexed for MEDLINE, such as:

- Citations preceding the date that a journal was selected for MEDLINE indexing.
- Out-of-scope citations (e.g., articles on plate tectonics or astrophysics) from certain MEDLINE journals, primarily general science and chemistry journals, for which the life sciences articles are indexed for MEDLINE.

Citations that have been indexed for MEDLINE and updated with NLM [Medical Subject Headings \(MeSH\)](#), publication types, GenBank accession numbers, and other indexing data are available daily. To limit your search to MEDLINE citations, add medline[sb] to your search.

Indexing method

The method used to assign Medical Subject Headings (MeSH) has changed over time. For more information, please see [Incorporating Values for Indexing Method in MEDLINE/PubMed XML](#). Use the following searches to find citations indexed with each method:

- Automated - MeSH indexing is provided algorithmically. Search: [indexingmethod_automated](#)
- Curated - MeSH indexing is provided algorithmically and a human reviewed (and possibly modified) the algorithm results. Search: [indexingmethod_curated](#)
- Manual – MeSH indexing is provided by humans with no algorithmic suggestions. Search: [indexingmethod_manual](#)

PubMed Central (PMC)

[PubMed Central \(PMC\)](#) is a full text archive that includes articles from journals reviewed and selected by NLM for archiving (current and historical), as well as individual articles and [preprints](#) collected for archiving in compliance with funder policies. Some PMC content is not cited in PubMed, such as book reviews and conference abstracts (see: [PubMed coverage](#)).

Preprints

As of June 2020, PubMed Central (PMC) includes preprints that report NIH-funded research results. Citations to these preprints are deposited in PubMed. To learn more, see: [NIH Preprint Pilot](#).

Example

To search for preprints in PubMed, include preprint[filter] in your query.

[covid-19 AND preprint\[pt\]](#)

Example

To exclude preprints from your search results in PubMed, use the Boolean operator NOT.

[covid-19 NOT preprint\[pt\]](#)**NCBI Bookshelf**

[Bookshelf](#) is a full text archive of books, reports, databases, and other documents related to biomedical, health, and life sciences. PubMed includes citations for books and some individual chapters available on Bookshelf.

PubMed format

The PubMed Format tags table defines the data tags that compose the PubMed format. The tags are presented in alphabetical order. Some of the tags (e.g., CIN) are not mandatory and therefore will not be found in every record. Other tags (e.g., AU, MH, and RN) may occur multiple times in one record. You can download records in PubMed format [as a text file \(.txt\)](#) or as an .nbib file for [exporting into citation management software programs](#).

Not all fields are searchable in PubMed. See [Search field tags](#) for the list of searchable fields.

PubMed Format tags

Tag	Name	Description
AB	Abstract	English language abstract taken directly from the published article
AD	Affiliation	Author or corporate author addresses
AID	Article Identifier	Article ID values supplied by the publisher may include the pii (controlled publisher identifier), doi (digital object identifier), or book accession
AU	Author	Authors
AUID	Author Identifier	Unique identifier associated with an author, corporate author, or investigator name
BTI	Book Title	Book Title
CI	Copyright Information	Copyright statement provided by the publisher
CIN	Comment In	Reference containing a comment about the article
CN	Corporate Author	Corporate author or group names with authorship responsibility
COI	Conflict of Interest	Conflict of interest statement
CON	Comment On	Reference upon which the article comments
CP	Chapter	Book chapter
CRDT	Create Date	The date the citation record was first created
CRF	Corrected and republished from	Final, correct version of an article
CRI	Corrected and republished in	Original article that was republished in corrected form
CTDT	Contribution Date	Book contribution date
CTI	Collection Title	Collection Title
DCOM	Completion Date	NLM internal processing completion date
DDIN	Dataset described in	Citation for the primary article resulting from a dataset

DRIN	Dataset use reported in	Citation for an article that uses a dataset from another scientific article
	Date of	
DEP	Electronic Publication	Electronic publication date
DP	Publication Date	The date the article was published
DRDT	Date Revised	Book Revision Date
ECF	Expression of Concern For	Reference containing an expression of concern for an article
ECI	Expression of Concern In	Cites the original article for which there is an expression of concern
EDAT	Entry Date	The date the citation was added to PubMed; the date is set to the publication date if added more than 1 year after the date published
EFR	Erratum For	Cites the original article for which there is a published erratum; as of 2016, partial retractions are considered errata
EIN	Erratum In	Cites a published erratum to the article
ED	Editor	Book editors
EN	Edition	Book edition
FAU	Full Author Name	Full author names
FED	Full Editor Name	Full editor names
FIR	Full Investigator Name	Full investigator or collaborator names
FPS	Full Personal Name as Subject	Full Personal Name of the subject of the article
GN	General Note	Supplemental or descriptive information related to the document
GR	Grants and Funding	Grant numbers, contract numbers, and intramural research identifiers associated with a publication
GS	Gene Symbol	Abbreviated gene names (used 1991 through 1996)
IP	Issue	The number of the issue, part, or supplement of the journal in which the article was published
IR	Investigator	Investigator or collaborator
IRAD	Investigator Affiliation	Investigator or collaborator addresses
IS	ISSN	International Standard Serial Number of the journal
ISBN	ISBN	International Standard Book Number
JID	NLM Unique ID	Unique journal ID in the NLM catalog of books, journals, and audiovisuals
JT	Full Journal Title	Full journal title from NLM cataloging data
LA	Language	The language in which the article was published
LID	Location ID	The pii or doi that serves the role of pagination
LR	Modification Date	Citation last revision date
MH	MeSH Terms	NLM Medical Subject Headings (MeSH) controlled vocabulary
MHDA	MeSH Date	The date MeSH terms were added to the citation. The MeSH date is the same as the Entrez date until MeSH are added
MID	Manuscript Identifier	Identifier assigned to an author manuscript submitted to the NIH Manuscript Submission System

NM	Substance Name	Supplementary Concept Record (SCR) data
OAB	Other Abstract	Abstract supplied by an NLM collaborating organization
OABL	Other Abstract Language	Language of an abstract available from the publisher
OCI	Other Copyright Information	Copyright owner
OID	Other ID	Identification numbers provided by organizations supplying citation data
ORI	Original Report In	Cites the original article associated with the patient summary
OT	Other Term	Non-MeSH subject terms (keywords) either assigned by an organization identified by the Other Term Owner, or generated by the author and submitted by the publisher
OTO	Other Term Owner	Organization that may have provided the Other Term data
OWN	Owner	Organization acronym that supplied citation data
PB	Publisher	Publishers of Books & Documents citations
PG	Pagination	The full pagination of the article Publisher supplied dates regarding the article publishing process and PubMed date stamps:
PHST	Publication History Status Date	<ul style="list-style-type: none"> • received: manuscript received for review • revised: manuscript revised by publisher or author • accepted: manuscript accepted for publication • aheadofprint: published electronically prior to final publication • entrez: PubMed Create Date [crdt] • pubmed: PubMed Entry Date [edat] • medline: PubMed MeSH Date [mhda]
PL	Place of Publication	Journal's (country only) or book's place of publication
PMC	PubMed Central Identifier	Unique identifier for the cited article in PubMed Central (PMC)
PMCR	PMC Release	Availability of PMC article
PMID	PubMed Unique Identifier	Unique number assigned to each PubMed citation
PS	Personal Name as Subject	Individual is the subject of the article
PST	Publication Status	Publication status
PT	Publication Type	The type of material the article represents
RF	Number of References	Number of bibliographic references for Review articles
RIN	Retraction In	Retraction of the article
RN	EC/RN Number	Includes chemical, protocol or disease terms. May also include a number assigned by the Enzyme Commission or by the Chemical Abstracts Service.
ROF	Retraction Of	Article being retracted
RPF	Republished From	Article being cited has been republished or reprinted in either full or abridged form from another source
RPI	Republished In	Article being cited also appears in another source in either full or abridged form
RRI	Retracted and Republished In	Final, republished version of an article

RRF	Retracted and Republished From	Original article that was retracted and republished
SB	Subset	Journal or citation subset values representing specialized topics
SFM	Space Flight Mission	NASA-supplied data space flight/mission name and/or number
SI	Secondary Source ID	Identifies secondary source databanks and accession numbers of molecular sequences discussed in articles
SO	Source	Composite field containing bibliographic information
SPIN	Summary For Patients In	Cites a patient summary article
STAT	Status Tag	Used for internal processing at NLM
TA	Journal Title Abbreviation	Standard journal title abbreviation
TI	Title	The title of the article
TT	Transliterated Title	Title of the article originally published in a non-English language, in that language
UIN	Update In	Update to the article
UOF	Update Of	The article being updated
VI	Volume	Volume number of the journal
VTI	Volume Title	Book Volume Title

PubMed data field descriptions

This documentation describes the fields found in PubMed records. If a field is searchable, the search tag appears after the field name in square brackets: Affiliation [ad]. A small number of searchable fields do not correspond to a specific field in the [PubMed format](#).

- See [Search field tags](#) for a list of searchable fields.
- See [PubMed format](#) for a quick table view of the fields found in PubMed records.

Affiliation [ad]

Affiliation may be included for authors, corporate authors and investigators, e.g., cleveland [ad] AND clinic [ad], if submitted by the publisher.

Multiple affiliations were added to citations starting from 2014, previously only the first author's affiliation was included. PubMed includes the note "Contributed equally" in the affiliation field when this information is supplied by publishers.

Searching for terms in the affiliation field searches in all author affiliations on a citation. For example, a search for Hopkins[ad] AND Bloomberg[ad] can find these terms spread across multiple authors' affiliations on the same citation.

To search for multiple terms appearing within the same affiliation, use a [proximity search](#). You can also search affiliations using a [phrase search](#); however, we suggest using a proximity search for more comprehensive results because affiliation data may be provided in a variety of ways for the same institution.

Example

Use [proximity searching](#) to find citations with authors from the Johns Hopkins Bloomberg School of Public Health:

["Hopkins Bloomberg Public"\[ad:~45\]](#)

This search will find any citation where the words "Hopkins," "Bloomberg," and "Public" appear in the same affiliation, with no more than forty-five words between each term. Search results may include:

- Johns Hopkins Bloomberg School of Public Health
- Johns Hopkins University, Bloomberg School of Public Health
- Bloomberg School of Public Health, Johns Hopkins University
- Bloomberg Johns Hopkins University School of Public Health
- ...and more!

All Fields [all]

Untagged terms and terms tagged with [all] are processed using [Automatic Term Mapping \(ATM\)](#). Terms that do not map are searched in all search fields except for Place of Publication, Create Date, Completion Date, Entry Date, MeSH Date, and Modification Date. Terms enclosed in double quotes or including wildcards (*) will be searched in all fields and not processed using automatic term mapping. PubMed ignores [stopwords](#).

Article Identifier [aid]

Includes article identifiers submitted by journal publishers such as DOI (digital object identifier).

Author [au]

The format to search for this field is: last name followed by a space and up to the first two initials followed by a space and a suffix abbreviation, if applicable, all without periods or a comma after the last name (e.g., fauci as or o'brien jc jr). Initials and suffixes may be omitted when searching.

PubMed automatically truncates a search for an author's name to account for varying initials, e.g., o'brien j [au] will retrieve o'brien ja, o'brien jb, o'brien jc jr, as well as o'brien j. To turn off automatic truncation, enclose the author's name in double quotes and tag with [au] in brackets, e.g., "o'brien j" [au] to retrieve just o'brien j.

Searching by full author name for articles published from 2002 forward is also possible, if available. See [NLM policy on author names](#).

Author Identifier [auid]

The author identifier includes a unique identifier associated with an author, corporate or investigator name, if supplied by a publisher. The field includes the organization authority that established the unique identifier, such as, ORCID, ISNI, VIAF, e.g., orcid 0000-0001-5027-4446 [auid].

Book [book]

The book search field includes book citations, e.g., genereviews [book].

Use the following untagged searches to retrieve all book or book chapters, e.g., ataxia AND pmcbookchapter

- books and chapters: pmcbook
- books: pmcbooktitle
- book chapters: pmcbookchapter

The above searches capture book records provided by the NCBI Bookshelf database; they exclude a small number of documents from other providers that appear in both PubMed and Bookshelf. For the most comprehensive search of

records appearing in both PubMed and Bookshelf, search "pubmed books"[sb].

Comment Correction Type

The data in these fields are citations to other associated journal publications, e.g., comments or errata. Often these link to the respective citation. Comments/Corrections data can be retrieved by the search term that follows each type:

- Comment in: hascommentin
- Comment on: hascommenton
- Corrected and republished in: hascorrectedrepublishedin
- Corrected and republished from: hascorrectedrepublishedfrom
- Dataset use reported in: hasassociatedpublication
- Dataset described in: hasassociateddataset
- Erratum in: haserratumin
- Erratum for: haserratumfor
- Expression of concern in: hasexpressionofconcernin
- Expression of concern for: hasexpressionofconcernfor
- Original Report in: hasoriginalreportin
- Republished in: hasrepublishedin
- Republished from: hasrepublishedfrom
- Retracted and republished in: hasretractedandrepublishedin
- Retracted and republished from: hasretractedandrepublishedfrom
- Retraction in: hasretractionin
- Retraction of: hasretractionof
- Summary for patients in: hassummaryforpatientsin
- Update in: hasupdatein
- Update of: hasupdateof

Completion Date [dcom]

Used by NLM for internal processing. Completion Date is not included in All Fields retrieval; the [dcom] search tag is required.

Conflict of Interest Statement [cois]

The conflict of interest statement from the published article. Conflict of interest statements are available when supplied by the publisher in the citation data sent to PubMed, or when included in full text articles in PubMed Central (PMC).

To retrieve all citations that contain conflict of interest statements, use the query hascois.

Corporate Author [cn]

Corporate author identifies the corporate or collective authorship of an article. Corporate names display exactly as they appear in the journal.

Note: Citations indexed pre-2000 and some citations indexed in 2000-2001 retain corporate authors at the end of the title field. For comprehensive searches, consider including terms and/or words searched in the title field [ti].

Create Date [crdt]

The date the citation record was first created in PubMed. Create Date can be helpful when checking PubMed for citations added since the last time a query was run. Create Date is not included in All Fields retrieval; the [crdt] search

tag is required.

EC/RN Number [rn]

EC/RN numbers are assigned by:

- The Food and Drug Administration (FDA) Substance Registration System for Unique Ingredient Identifiers (UNII)s, e.g., Y92OUS2H9B
- The Enzyme Commission (EC) to designate a particular enzyme, e.g., EC 1.1.1.57
- The Chemical Abstracts Service (CAS) for Registry Numbers, e.g., 2751-14-6

The EC/RN number search field includes both the Registry Number and the Related Registry Number (available in the NLM MeSH Browser).

Editor [ed]

The editor search field includes the editors for book or chapter citations.

Entry Date [edat]

Entry date (EDAT) is used for PubMed processing, such as “Most Recent” sort order (i.e., last in, first out).

EDAT is typically set within 24 hours of the citation’s availability in PubMed. Exceptions: As of December 15, 2008, citations added to PubMed more than twelve months after the date of publication have the EDAT set to the date of publication, except for book citations. Prior to this, the Entry Date was set to the Publication Date on citations published before September 1997. Entry Date is not included in All Fields retrieval; the [edat] search tag is required.

Note: Entry Date was called Entrez Date in the legacy PubMed system (retired in 2020).

Filter [filter] [sb]

Technical tags used by LinkOut, filters include:

- loall[sb] - citations with LinkOut links in PubMed
- free full text[sb] - citations that include a link to a free full text article
- full text[sb] - citations that include a link to a full text article

First Author Name [1au]

The first personal author name in a citation.

Full Author Name [fau]

The full author name for articles published from 2002 forward, if available. Full author searches can be entered in natural or inverted order, e.g., julia s wong or wong julia s.

Full Investigator Name [fir]

The index for the article's full investigator or collaborator name, if available. Full investigator searches can be entered in natural or inverted order, e.g., harry janes or janes harry.

Grants and Funding [gr]

The Grants and funding [gr] search field (previously Grant Number) includes grant numbers, contract numbers, or other intramural research identifiers associated with a publication.

The most common type of funding information associated with a publication in PubMed are grant numbers. Data in the Grants and funding search field can consist of up to four parts:

1. **Number** contains the grant, contract, intramural project number (or both) that designates financial support by any agency of the United States Public Health Service (US PHS), any institute of the National Institutes of Health, or other organization.
2. **Funder code** contains the 2-letter grant code or funding organization acronym, for example: CA for National Cancer Institute or DDCF for Doris Duke Charitable Foundation. See [Grant Number Information Found in the GR Field in MEDLINE/PubMed \(Archived\)](#) for the 2-character abbreviations, PHS agency acronyms, and other US and non-US funding organizations.
3. **Agency** includes the acronym or mnemonic in the case of US PHS agencies, or full organization name. As of 2009 this includes the agency's hierarchical structure from lower to higher entity, when known. For example, NCI NIH HHS for National Cancer Institute, National Institutes of Health, U.S. Department of Health and Human Services.
4. **Country** contains the home country of the funding agency, for example: United States.

Each individual part can be searched using [gr], for example: CA101211[gr], CA[gr], NCI[gr], NIH[gr], or United States[gr].

This field can also be searched to find articles with intramural support; e.g., "intramural nih"[gr] finds all journal citations authored by intramural NIH staff.

Completeness of funding information in PubMed will vary by source.

See [Grants and funding](#) for more information about data in this field.

Investigator [ir]

Names of principal investigator(s) or collaborators who contributed to the research. Search names following the author field format, for example: sollar b[ir].

ISBN [isbn]

The ISBN for book or book chapters.

Issue [ip]

The number of the journal issue in which the article was published.

Journal [ta]

The journal search field includes the journal title abbreviation, full journal title, or ISSN/eISSN number (e.g., J Biol Chem, Journal of Biological Chemistry, 0021-9258). If a journal title contains special characters, e.g., parentheses, brackets, enter the name without these characters, e.g., enter J Hand Surg [Am] as J Hand Surg Am.

Language [la]

The language search field includes the language in which the article was published. Note that many non-English articles have English language abstracts. You may search using either the language or the first three characters of most

languages, e.g., chi [la] retrieves the same results as chinese [la]. The most notable exception is jpn [la] for Japanese.

Last Author Name [lastau]

The last personal author name in a citation.

Location ID [lid]

Location ID includes the DOI or publisher ID that serves the role of pagination to locate an online article.

MeSH Date [mhda]

The date MeSH terms were added to the citation. MeSH Date is initially set to the [Entry Date \[EDAT\]](#) when the citation is added to PubMed; citations added to PubMed more than twelve months after the date of publication have EDAT and MHDA set to the date of publication.

MeSH Date is not included in All Fields retrieval; the [mhda] search tag is required.

Dates must be entered using the format YYYY/MM/DD [mhda], e.g., 2000/03/15 [mhda]. The month and day are optional (e.g., 2000 [mhda] or 2000/03 [mhda]).

To enter a date range, insert a colon (:) between each date, e.g., 1999:2000 [mhda] or 2000/03:2000/04 [mhda].

MeSH Major Topic [majr]

A MeSH term that is one of the main topics discussed in the article denoted by an asterisk on the MeSH term or MeSH/Subheading combination, e.g., Cytokines/physiology* See [MeSH Terms \[mh\]](#) below.

MeSH Subheadings [sh]

[MeSH Subheadings](#) are used with MeSH terms to help describe more completely a particular aspect of a subject. For example, the drug therapy of asthma is displayed as asthma/drug therapy; see MeSH/Subheading Combinations in [MeSH Terms \[mh\]](#) below.

The MeSH Subheading field allows users to "free float" Subheadings, e.g., hypertension [mh] AND toxicity [sh].

MeSH Subheadings automatically include the [more specific Subheading terms](#) under the term in a search. To turn off this automatic feature, use the search syntax [sh:noexp], e.g., therapy [sh:noexp].

In addition, you can enter the two-letter [MeSH Subheading abbreviations](#) rather than spelling out the Subheading, e.g., dh [sh] = diet therapy [sh].

MeSH Terms [mh]

The [NLM Medical Subject Headings](#) controlled vocabulary of biomedical terms that is used to describe the subject of each journal article in MEDLINE. MeSH is updated annually to reflect changes in medicine and medical terminology. MeSH terms are arranged hierarchically by subject categories with more specific terms arranged beneath broader terms. PubMed allows you to view this hierarchy and select terms for searching in the MeSH Database.

MEDLINE articles are automatically indexed with MeSH terms using a well-refined algorithm. Applying the MeSH vocabulary ensures that articles are uniformly indexed by subject, whatever the author's words. For more information, see [Frequently Asked Questions about Indexing for MEDLINE](#).

More information about MeSH Terms and Major MeSH Topic search fields:

- To search the term only as a MeSH term, it must be tagged using the search field, e.g., [mh] for MeSH Terms or [majr] for MeSH Major Topic. A tagged term is checked against the [subject translation table](#), and then mapped to the appropriate MeSH term(s); entry terms tagged with [mh] also map to the appropriate MeSH term(s), increasing the access points to the citations since a searcher may not know the exact preferred term for a MeSH Descriptor. To search for the exact term only and turn off mapping to multiple MeSH terms, enter the tagged MeSH term in double quotes.
- MeSH terms are arranged hierarchically by subject categories with more specific terms arranged beneath broader terms. MeSH terms in PubMed automatically include the more specific MeSH terms in a search. To turn off this automatic feature, use the search syntax [mh:noexp], e.g., neoplasms [mh:noexp]. For more detailed information about MeSH vocabulary including the hierarchical structure, please see the [MeSH homepage](#).
- MeSH/Subheading Combinations: To directly attach MeSH Subheadings, use the format MeSH Term/Subheading, e.g., neoplasms/diet therapy. You may also use the [two-letter MeSH Subheading abbreviations](#), e.g., neoplasms/dh. The [mh] tag is not required, however [majr] may be used, e.g., plants/genetics[majr]. Only one Subheading may be directly attached to a MeSH term. For a MeSH/Subheading combination, PubMed always includes the more specific terms arranged beneath broader terms for the MeSH term and also includes the more specific terms arranged beneath broader [Subheadings](#). The broader Subheading, or one of its indentions, will be directly attached to the MeSH term or one of its indentions. For example, hypertension/therapy also retrieves hypertension/diet therapy; hypertension/drug therapy; hypertension, malignant/therapy; hypertension, malignant/drug therapy, and so on, as well as hypertension/therapy.
- To turn off the automatic inclusion of the more specific terms, use the syntax [field:noexp], e.g., hypertension [mh:noexp], or hypertension [majr:noexp], or hypertension/therapy [mh:noexp]. The latter example turns off the more specific terms in both parts, searching for only the one Subheading therapy attached directly to only the one MeSH term hypertension.
- If parentheses are embedded in a MeSH term, replace the parentheses with a space and tag with [mh] e.g., enter the MeSH term Benzo(a)pyrene as benzo a pyrene [mh].
- MeSH terms can be selected for searching in the MeSH database and from the advanced search builder index.

Modification Date [lr]

Modification date is a completed citation's most recent revision date. Modification Date is not included in All Fields retrieval; the [lr] search tag is required.

NLM Unique ID [jid]

The NLM ID is the alpha-numeric identifier for the cited journal that was assigned by the NLM Integrated Library System LocatorPlus, e.g., 0375267 [jid].

Other Term [ot]

The author keyword field (OT field) is searchable with the title/abstract [tiab], text word [tw] and other term [ot] search tags. To retrieve all citations that have keywords, use the query haskeyword. Other term data may display an asterisk to indicate a major concept; however, you cannot search other terms with a major concept tag.

Owner

The owner search field includes the acronym that identifies the organization that supplied the citation data. Search using owner + the owner acronym, e.g., ownernasa.

Pagination [pg]

Enter only the first page number that the article appears on. The citation will display the full pagination of the article but this field is searchable using only the first page number.

Personal Name as Subject [ps]

Use this search field tag to limit retrieval to where the name is the subject of the article, e.g., varmus h[ps]. Search for personal names as subject using the author field format, e.g., varmus h[ps].

Pharmacological Action [pa]

Substances known to have a particular pharmacologic action. Each pharmacologic action term index is created with the drug/substance terms known to have that effect. This includes both MeSH terms and terms for Supplementary Concept Records.

Place of Publication [pl]

Indicates the cited journal's country of publication. Geographic place of publication regions are not searchable. In order to retrieve records for all countries in a region (e.g., North America) it is necessary to OR together the countries of interest. Note: This field is not included in all fields or text word retrieval.

PMCID and MID

Search for PMC or NIH manuscript identifiers using the appropriate prefix followed by the ID number, e.g., PMC2600426. To retrieve all NIH manuscript citations, use the query hasnihmsid.

PMID [pmid]

To search for a PubMed Identifier (PMID), enter the ID with or without the search field tag [pmid]. You can search for several PMIDs by entering each number in the search box separated by a space (e.g., 17170002 16381840); PubMed will OR the PMIDs together. To search PMIDs in combination with other terms, the search field tag is required: lipman AND 16381840[pmid].

PMIDs do not change over time or during processing and are never reused.

Publication Date [dp]

Publication date is the date that the article was published. The search field tags [dp] and [pdat] may be used interchangeably for publication date searching.

Dates or date ranges must be searched using the format yyyy/mm/dd [dp], e.g., 1998/03/06 [dp]. The month and day are optional (e.g., 1998 [dp] or 1998/03 [dp]).

To enter a date range search, insert a colon (:) between each date, e.g., 1996:1998 [dp] or 1998/01:1998/04 [dp].

Use the following format to search X days, months or years immediately preceding today's date where X = numeric value:

- "last X days"[dp]
- "last X months"[dp]
- "last X year"[dp]

More information about publication dates:

- The time between an article's publication and the citation's availability in PubMed varies depending on when the publisher deposits the citation to PubMed. Because of this, searching with Create Date [crdt] (the date a citation was created in PubMed) is often more comprehensive than Publication Date [dp] when checking PubMed on a regular basis for new citations.
- Journals vary in the way the publication date appears on an issue. Some journals include just the year, whereas others include the year plus month or year plus month plus day. And, some journals use the year and season (e.g., Winter 1997). The publication date in the citation is recorded as it appears in the journal.
- Publication dates without a month are set to January, multiple months (e.g., Oct-Dec) are set to the first month, and dates without a day are set to the first day of the month. Dates with a season are set as: winter = January, spring = April, summer = July and fall = October.
- If an article is published electronically and in print on different dates both dates are searchable and may be included on the citation prefaced with an Epub or Print label. The electronic date will not be searchable if it is later than the print date, except when range searching.
- To search for electronic dates only use the search tag [EPDAT], for print dates only tag with [PPDAT].
- Most journals now publish articles online on a continuous basis, as soon as they are ready for publication (after peer review and editing, etc.) instead of, or in addition to, publishing collections of articles as an "issue" on a periodic basis. When a journal deposits a citation for an "online first" article in PubMed, NLM appends the note "[Online ahead of print]" to the online publication date. The citation is updated, and the ahead of print notation removed, when the article is included in a journal issue. The lag between the "online first" and "issue" publication dates may be days, weeks, months, or more than a year. In many cases, depending on the journal, the online first version is considered to be the version of record. The "[Online ahead of print]" note in PubMed should not be taken to mean that the cited article is not the version of record.
- Bookshelf citation publication dates are generated from the book's original publication date. Publication date searches include Contribution Date (CTDT) and Date Revised (DRDT) in addition to Publication Date (DP) for Book citations.

Publication Type [pt]

Describes the material presented in the article (e.g., Review, Clinical Trial, Retracted Publication, Letter). Citations may include multiple Publication Types. Use the search tag [pt] with any PubMed [Publication Type](#), e.g., review[pt].

Publication Types are arranged hierarchically with more specific terms arranged beneath broader terms, and publication types automatically include the more specific publication types in a search. To turn off this automatic feature, use the search syntax [pt:noexp], e.g., review [pt:noexp].

Publisher [pubn]

Includes publisher names for Bookshelf citations.

Secondary Source ID [si]

The SI field identifies secondary source databanks and accession numbers, e.g., GenBank, GEO, PubChem, [ClinicalTrials.gov](#), ISRCTN. The field is composed of the source followed by a slash followed by an accession number and can be searched with one or both components, e.g., genbank [si], AF001892 [si], genbank/AF001892 [si]. To retrieve all citations with an SI value, search hasdatabanklist.

Subset [sb]

The subset field is a method of restricting retrieval by subject, citation status and journal category, with the search tag [SB]. See also [filters](#) and [Find related resources using LinkOut](#).

Supplementary Concept [nm]

Includes chemical, protocol, disease or organism terms. Synonyms to the supplementary concepts will automatically map when tagged with [nm]. This field was implemented in mid-1980; however, many chemical names are searchable as MeSH terms before that date.

Text Words [tw]

Includes all words and numbers in the title, abstract, other abstract, MeSH terms, MeSH Subheadings, Publication Types, Substance Names, Personal Name as Subject, Corporate Author, Secondary Source, Comment/Correction Notes, and Other Terms (see [Other Term \[OT\]](#) above) typically non-MeSH subject terms (keywords), including NASA Space Flight Mission, assigned by an organization other than NLM.

Title [ti]

Words and numbers included in the title of a citation, as well as the collection title for book citations.

Title/Abstract [tiab]

Words and numbers included in a citation's title, collection title, abstract, other abstract and author keywords ([Other Term \[ot\]](#) field). English language abstracts are taken directly from the published article. If an article does not have a published abstract, NLM does not create one.

Transliterated Title [tt]

Words and numbers in title originally published in a non-English language, in that language. Non-Roman alphabet language titles are transliterated. Transliterated title is not included in [Text Word \[TW\]](#) retrieval.

Volume [vi]

The number of the journal volume in which an article is published.

NLM author indexing policy

NLM author indexing policy is as follows:

- 1966 - 1984: MEDLINE did not limit the number of authors.
- 1984 - 1995: The NLM limited the number of authors to 10, with "et al" as the eleventh occurrence.
- 1996 - 1999: The NLM increased the limit from 10 to 25. If there were more than 25 authors, the first 24 were listed, the last author was used as the 25th, and the twenty-sixth and beyond became "et al."
- 2000 - Present: MEDLINE does not limit the number of authors.

More information:

- Beginning in mid-2005, the policy restrictions on number of author names in past years were lifted so that on an individual basis, a citation may be edited to include all author names in the published article, regardless of the limitation in effect when the citation was created.
- Effective with 1992 date of publication, letters are indexed individually with authors rather than as an anonymous group.
- Until 1990, NLM transliterated up to five authors' Cyrillic or Japanese names to the Roman alphabet.
- Between 1990 and 2016, the first ten Cyrillic or Japanese names are transliterated. Chinese ideograms were not transliterated by NLM, but if transliterations of the authors names are available in the journal article or table of contents, they were included in the citation, even if that includes only one author in a multi-author article.

Beginning in 2016, author names are published in Roman characters in all MEDLINE journals, and NLM no longer transliterates Cyrillic or Japanese names. All author names are included as published.

Error messages

System error messages

Please provide your IT staff with the technical [browser advice for NCBI web pages](#) to ensure your browser, firewall, and servers are enabled for JavaScript, cookies, pop-ups, and HTTP 1.1. Antivirus software may affect page caching which can result in unexpected page expired messages. Also, nlm.nih.gov should be added as a browser exception and be considered a trusted site by your system and network. You may have to delete your browser's cache (temporary files) before trying to access PubMed again.

Typographical errors

Please contact the journal publisher directly to report an error and initiate a correction to PubMed citations for content other than MeSH.

To report a MeSH error in a PubMed citation, please contact the [NLM Help Desk](#) and include the PMID number (e.g., PMID: 12345678), and an indication of the incorrect and correct information.

NLM provides data to vendors around the world. Other products and services will not necessarily immediately reflect corrections made to PubMed records. If you search through a vendor's system, please contact your vendor about their maintenance schedules.

Cookies

A "cookie" is information stored by a web site server on your computer. See the [NLM Privacy Policy](#) for additional information.

In the case of PubMed, cookies store information about your interactions that may be needed later to perform a function. To use these interactive features you need to enable cookies on your computer. Consult your browser's help for information on enabling cookies.

If you have problems using cookie-dependent features of PubMed, even after enabling cookies, possible reasons may include:

- Cookies are blocked by your provider or institution. Check with your Internet provider and/or the system administrator at your institution to see if cookies can be accepted. Even if you have them enabled in your web browser, if they are blocked by your provider or institution (e.g., by a firewall, proxy server, etc.), cookie-dependent features of PubMed won't work.
- Your computer's date and time settings are incorrect. Check your computer's time settings to ensure that they are correct.

MeSH Subheadings

See the MeSH Subheadings table below and [scope notes and allowable categories](#) on the NLM website.

Abbreviation	MeSH Subheading	Abbreviation	MeSH Subheading
AB	Abnormalities	IR	Innervation
AD	Administration and Dosage	IS	Instrumentation
AE	Adverse Effects	IP	Isolation and Purification

AG	Agonists	LJ	Legislation and Jurisprudence
AA	Analogues and Derivatives	ME	Metabolism
AN	Analysis	MT	Methods
AH	Anatomy and Histology	MI	Microbiology
AI	Antagonists and Inhibitors	MO	Mortality
BI	Biosynthesis	NU	Nursing
BS	Blood Supply	OG	Organization and Administration
BL	Blood	PS	Parasitology
CF	Cerebrospinal Fluid	PY	Pathogenicity
CS	Chemical Synthesis	PA	Pathology
CI	Chemically Induced	PK	Pharmacokinetics
CH	Chemistry	PD	Pharmacology
CL	Classification	PH	Physiology
CO	Complications	PP	Physiopathology
CN	Congenital	PO	Poisoning
CY	Cytology	PC	Prevention and Control
DF	Deficiency	PX	Psychology
DI	Diagnosis	RE	Radiation Effects
DH	Diet Therapy	RT	Radiotherapy
DG	Diagnostic Imaging	RH	Rehabilitation
DE	Drug Effects	SC	Secondary
DT	Drug Therapy	ST	Standards
EC	Economics	SN	Statistics and Numerical Data
ED	Education	SD	Supply and Distribution
EM	Embryology	SU	Surgery
EN	Enzymology	TU	Therapeutic Use
EP	Epidemiology	TH	Therapy
ES	Ethics	TO	Toxicity
EH	Ethnology	TM	Transmission
ET	Etiology	TR	Transplantation
GE	Genetics	TD	Trends
GD	Growth and Development	UL	Ultrastructure
HI	History	UR	Urine
IM	Immunology	VE	Veterinary
IN	Injuries	VI	Virology

Stopwords

Stopwords

A a, about, again, all, almost, also, although, always, among, an, and, another, any, are, as, at

B be, because, been, before, being, between, both, but, by

C can, could

D did, do, does, done, due, during

E each, either, enough, especially, etc

F for, found, from, further

H had, has, have, having, here, how, however

I i, if, in, into, is, it, its, itself

J just

K kg, km

M made, mainly, make, may, mg, might, ml, mm, most, mostly, must

N nearly, neither, no, nor

O obtained, of, often, on, our, overall

P perhaps, pmid

Q quite

R rather, really, regarding

S seem, seen, several, should, show, showed, shown, shows, significantly, since, so, some, such

T than, that, the, their, theirs, them, then, there, therefore, these, they, this, those, through, thus, to

U upon

V various, very

W was, we, were, what, when, which, while, with, within, without, would

PubMed character conversions

Certain characters have special meaning in searches, others are converted to spaces.

Searches that include the following characters are translated as follows:

parentheses () - used to create Boolean nesting

square brackets [] - search field tag qualification

ampersand & - Boolean operator AND

pipe | - Boolean operator OR

forward slash / - MeSH/Subheading combinations

colon : - designates a range operation

double quotes " - used to force a phrase search

pound sign # - designates a History search statement when immediately followed by a number, e.g., #1 AND cat

asterisk * - wildcard symbol, e.g., toxicol*

Characters converted to spaces in search queries:

exclamation mark !

pound sign #

dollar sign \$

percentage sign %

asterisk * (if it cannot be used in a wildcard search, for example, when a term is too short)

plus symbol +

minus symbol -

period .

comma ,

semi-colon ;

angle brackets < >

equal sign =

question mark ?

backslash \

caret ^

underscore _
curly brackets { }
approximately ~
single quotes '

Some characters have special meaning in [MeSH fields](#):

forward slash /
hyphens -
comma ,

Publication Types

Publication types found in PubMed are listed below. See [Publication Type \[PT\]](#) and [MeSH Publication Types with Scope Notes](#) for more information; however, not all MeSH Publication Types are included in PubMed.

Discontinued Publication Types are marked in the list below with an asterisk (*). [Discontinued Publication Types](#) continue to exist in MeSH, appear on existing citations, and are searchable in PubMed; however, they are not applied to new citations during MEDLINE indexing.

- Adaptive Clinical Trial
- Address
- Autobiography *
- Bibliography *
- Biography
- Case Reports
- Classical Article
- Clinical Conference
- Clinical Study
- Clinical Trial
- Clinical Trial, Phase I
- Clinical Trial, Phase II
- Clinical Trial, Phase III
- Clinical Trial, Phase IV
- Clinical Trial Protocol
- Clinical Trial, Veterinary
- Collected Work
- Comment
- Comparative Study
- Congress
- Consensus Development Conference
- Consensus Development Conference, NIH *
- Controlled Clinical Trial
- Corrected and Republished Article
- Dataset
- Dictionary *
- Directory *
- Duplicate Publication
- Editorial
- Electronic Supplementary Materials
- English Abstract
- Equivalence Trial
- Evaluation Study
- Expression of Concern

Festschrift
Government Publication *
Guideline
Historical Article
Interactive Tutorial *
Interview
Introductory Journal Article
Journal Article (Default value when no more descriptive PT is provided or assigned)
Lecture
Legal Case *
Legislation *
Letter
Meta-Analysis
Multicenter Study
Network Meta-Analysis
News
Newspaper Article *
Observational Study
Observational Study, Veterinary
Overall *
Patient Education Handout
Periodical Index *
Personal Narrative
Portrait *
Practice Guideline
Preprint
Pragmatic Clinical Trial
Published Erratum
Randomized Controlled Trial
Randomized Controlled Trial, Veterinary
Research Support, American Recovery and Reinvestment Act
Research Support, N.I.H., Extramural
Research Support, N.I.H., Intramural
Research Support, Non-U.S. Gov't
Research Support, U.S. Gov't, Non-P.H.S.
Research Support, U.S. Gov't, P.H.S.
Retracted Publication
Retraction Notice
Review
Scientific Integrity Review *
Scoping Review
Systematic Review
Technical Report *
Twin Study
Validation Study
Video-Audio Media
Webcast

Status Subsets

How to Search

`publisher[sb]` NOT

Citation Status

Citations recently added to PubMed via electronic submission from a publisher, and are soon to proceed to the next stage, PubMed - in process (see below). Also for citations received before

pubstatusnihms NOT pubstatuspmcsd NOT pmcbook	late 2003 if they are from journals not indexed for MEDLINE, or from a journal that was accepted for MEDLINE after the citations' publication date. These citations bibliographic data have not been reviewed.
inprocess[sb] medline[sb]	MeSH terms will be assigned if the subject of the article is within the scope of MEDLINE. Citations that have been indexed with MeSH terms, Publication Types, Substance Names, etc.
pubstatusnihms AND publisher[sb]	Author manuscripts submitted to PMC that fall under the NIH Public Access Policy.
pubstatuspmcsd AND publisher[sb]	Records for selective deposit articles in PMC. These are articles published in non-MEDLINE journals where the publisher has chosen to deposit in PMC only those articles that fall under the NIH Public Access Policy.
pmcbook	Book and book chapter citations available on the NCBI Bookshelf.
pubmednotmedline[sb]	Citations that will not receive MEDLINE indexing because they are for articles in non-MEDLINE journals, or they are for articles in MEDLINE journals but the articles are out of scope, or they are from issues published prior to the date the journal was selected for indexing, or citations to articles from journals that deposit their full text articles in PMC but have not yet been recommended for indexing in MEDLINE.

Filter search strategies

- [Publication date](#)
- [Text availability](#)
- [Article attribute](#)
- [Article type](#)
- [Article language](#)
- [Species](#)
- [Sex](#)
- [Age](#)
- [Other](#)

Publication date

Filter name	PubMed equivalent
1 year	"last year"[dp]
5 years	"last 5 years"[dp]
10 years	"last 10 years"[dp]
Custom range	See: Searching for a date range

Text availability

Filter name	PubMed equivalent
Abstract	hasabstract
Free full text	free full text[sb]
Full text	full text[sb]

Article attribute

Filter name	PubMed equivalent
Associated data	data[sb]

Article type

Most article type filters use the article type name with the [publication type \[pt\]](#) search field tag; for example, "multicenter study"[pt].

The Systematic Review filter uses a [search strategy](#) in addition to the publication type [pt].

The Books and Documents filter uses the following query: "pubmed books"[sb].

Article language

The [article language filters](#) use the language name with the [language \[la\]](#) search field tag; for example, esperanto[la].

Species

Filter name PubMed equivalent

Humans humans[mh]

Other animals "animals"[mh:noexp]

Sex

Filter name PubMed equivalent

Female female[mh]

Male male[mh]

Age

Filter name	PubMed equivalent
Child: birth-18 years	(infant[mh] OR child[mh] OR adolescent[mh])
Newborn: birth-1 month	infant, newborn[mh]
Infant: birth-23 months	infant[mh]
Infant: 1-23 months	infant[mh:noexp]
Preschool Child: 2-5 years	child, preschool[mh]
Child: 6-12 years	child[mh:noexp]
Adolescent: 13-18 years	adolescent[mh]
Adult: 19+ years	adult[mh]
Young Adult: 19-24 years	"young adult"[mh]
Adult: 19-44 years	adult[mh:noexp]
Middle Aged + Aged: 45+ years	(middle aged[mh] OR aged[mh])
Middle Aged: 45-64 years	middle aged[mh]
Aged: 65+ years	aged[mh]
80 and over: 80+ years	aged, 80 and over[mh]

Other

See [Other filters and more subsets](#).

Clinical Queries filters

- [COVID-19 Articles](#)
- [Clinical Study Categories](#)
- [Medical Genetics](#)

COVID-19 article filters

The COVID-19 article filters limit retrieval to citations about the 2019 novel coronavirus; these filters may evolve over time.

Category	Filter name	PubMed equivalent
General	LitCGeneral	<p>("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT]))</p> <p>("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("metabolic"[All Fields] OR "metabolical"[All Fields] OR "metabolically"[All Fields] OR "metabolics"[All Fields] OR "metabolism"[MeSH Terms] OR "metabolism"[All Fields] OR "metabolisms"[All Fields] OR "metabolism"[MeSH Subheading] OR "metabolic networks and pathways"[MeSH Terms] OR ("metabolic"[All Fields] AND "networks"[All Fields] AND "pathways"[All Fields]) OR "metabolic networks and pathways"[All Fields] OR "metabolites"[All Fields] OR "metabolization"[All Fields] OR "metabolize"[All Fields] OR "metabolized"[All Fields] OR "metabolizer"[All Fields] OR "metabolizers"[All Fields] OR "metabolizes"[All Fields] OR "metabolizing"[All Fields] OR "virology"[MeSH Subheading] OR ("mechanism"[All Fields] OR "mechanisms"[All Fields]) OR ("etiology"[MeSH Subheading] OR "etiology"[All Fields] OR "pathogenesis"[All Fields]) OR "pathologic process*"[All Fields])</p> <p>("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] :</p>
Mechanism	LitCMechanism	<p>("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] :</p>
Transmission	LitCTransmission	<p>("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] :</p>

3000/12/31[PDAT])) AND ("transmission"[Text Word] OR "transmission"[MeSH Subheading] OR "replication"[Text Word] OR "disease transmission, infectious"[MeSH Terms])

("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR ("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("diagnos*"[All Fields] OR "detect*"[All Fields] OR "diagnosis"[MeSH Terms] OR "diagnostic equipment"[MeSH Terms] OR "diagnostic errors"[MeSH Terms] OR "diagnostic imaging"[MeSH Terms] OR "diagnostic services"[MeSH Terms] OR "diagnosis, differential"[MeSH Terms] OR "diagnosis"[MeSH Subheading])

("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR ("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "treatments"[All Fields] OR "therapy"[MeSH Subheading] OR "therapy"[All Fields] OR "treatment"[All Fields] OR "treatment s"[All Fields] OR "treat*"[All Fields] OR ("clinical trial"[Publication Type] OR "clinical trials as topic"[MeSH Terms] OR "clinical trials"[All Fields]) OR ("clinical trial"[Publication Type] OR "clinical trials as topic"[MeSH Terms] OR "clinical trial"[All Fields]) OR ("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trial"[All Fields] OR "randomised controlled trial"[All Fields]) OR ("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trials"[All Fields] OR "randomised controlled trials"[All Fields]) OR ("therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapies"[All Fields] OR "therapy"[MeSH Subheading] OR "therapy"[All Fields] OR "therapy s"[All Fields] OR "therapys"[All Fields]) OR ("therapeutical"[All Fields] OR "therapeutically"[All Fields] OR "therapeutics"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapeutic"[All Fields]))

("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR ("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("transmission*"[All Fields] OR "prevent*"[All Fields] OR "intervent*"[All Fields] OR ("prognosis"[MeSH Terms] OR "prognosis"[All

Diagnosis LitCDiagnosis

Treatment LitCTreatment

Prevention LitCPrevention

Fields] OR "prognoses"[All Fields]) OR "treatment outcome"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("therapeutical"[All Fields] OR "therapeutically"[All Fields] OR "therapeutics"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "therapeutic"[All Fields]) OR "therapeutic*"[All Fields])

("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("case report*"[All Fields] OR ("case reports"[Publication Type] OR "case reports"[All Fields]) OR "report a case"[All Fields] OR ("report*"[All Fields] AND ("ambulatory care facilities"[MeSH Terms] OR ("ambulatory"[All Fields] AND "care"[All Fields] AND "facilities"[All Fields]) OR "ambulatory care facilities"[All Fields] OR "clinic"[All Fields] OR "clinic s"[All Fields] OR "clinical"[All Fields] OR "clinically"[All Fields] OR "clinicals"[All Fields] OR "clinics"[All Fields] OR "patient*"[All Fields])) OR "reported case"[All Fields] OR "clinical presentation*"[All Fields] OR "patient management"[All Fields] OR "infected patient*"[All Fields])

Case Report LitCCaseReport

("COVID-19" OR "COVID19" OR "COVID-19"[MeSH Terms] OR "COVID-19 Vaccines" OR "COVID-19 Vaccines"[MeSH Terms] OR "COVID-19 serotherapy" OR "COVID-19 serotherapy"[MeSH Terms] OR "COVID-19 Nucleic Acid Testing" OR "covid-19 nucleic acid testing"[MeSH Terms] OR "COVID-19 Serological Testing" OR "covid-19 serological testing"[MeSH Terms] OR "COVID-19 Testing" OR "covid-19 testing"[MeSH Terms] OR "SARS-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "sars-cov-2"[MeSH Terms] OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "2019 NCOV" OR (("coronavirus"[MeSH Terms] OR "coronavirus" OR "COV" OR "NCOV") AND 2019/11/01[PDAT] : 3000/12/31[PDAT])) AND ("forecast*"[All Fields] OR ("forecasted"[All Fields] OR "forecaster"[All Fields] OR "forecasters"[All Fields] OR "forecasting"[MeSH Terms] OR "forecasting"[All Fields] OR "forecast"[All Fields] OR "forecasts"[All Fields] OR "trends"[MeSH Subheading] OR "trends"[All Fields]) OR "trend*"[All Fields] OR "prediction*"[All Fields])

Forecasting LitCForecasting

"COVID-19 sequela*" OR (("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2") AND sequela*) OR "post acute sequelae of Sars-CoV-2" OR ("PASC" AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "post acute sequelae of COVID" OR ("post-intensive care syndrome" OR "postintensive care syndrome") AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019 Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "post COVID condition*" OR ("PCC" AND ("COVID-19" OR "COVID19" OR "Sars-CoV-2" OR "SARSCoV2" OR "SARSCoV-2" OR "SARS-CoV2" OR "2019

Long COVID

LitCLongCOVID

Novel Coronavirus" OR "2019-nCoV" OR "Coronavirus Disease 2019" OR "Coronavirus Disease-19" OR "SARS Coronavirus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2")) OR "convalescent COVID-19" OR "long haul COVID" OR "COVID long haul*" OR "long COVID" OR "long term COVID" OR "COVID-19 survivor*" OR "post COVID-19 symptom*" OR "chronic COVID syndrome" OR "post COVID syndrome" OR "post COVID-19 neurological syndrome" OR "post acute COVID-19" OR "post-acute COVID-19 syndrome"[MeSH Terms] OR "COVID-19 post-intensive care syndrome"[Supplementary Concept]

Clinical Study Categories

The Clinical Study Categories search filters are based on the work of [Haynes RB et al.](#)

Category	Optimized for	Sensitive/ Specific	PubMed equivalent
Therapy	sensitive/broad	99%/70%	((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials as topic[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading])
	specific/narrow	93%/97%	(randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))
Diagnosis	sensitive/broad	98%/74%	(sensitiv*[Title/Abstract] OR sensitivity and specificity[MeSH Terms] OR diagnose[Title/Abstract] OR diagnosed[Title/Abstract] OR diagnoses[Title/Abstract] OR diagnosing[Title/Abstract] OR diagnosis[Title/Abstract] OR diagnostic[Title/Abstract] OR diagnosis[MeSH:noexp] OR (diagnostic equipment[MeSH:noexp] OR diagnostic errors[MeSH:noexp] OR diagnostic imaging[MeSH:noexp] OR diagnostic services[MeSH:noexp]) OR diagnosis, differential[MeSH:noexp] OR diagnosis[Subheading:noexp])
	specific/narrow	64%/98%	(specificity[Title/Abstract])
Etiology	sensitive/broad	93%/63%	(risk*[Title/Abstract] OR risk*[MeSH:noexp] OR (risk adjustment[MeSH:noexp] OR risk assessment[MeSH:noexp] OR risk factors[MeSH:noexp] OR risk management[MeSH:noexp] OR risk taking[MeSH:noexp]) OR cohort studies[MeSH Terms] OR group[Text Word] OR groups[Text Word] OR grouped [Text Word])
	specific/narrow	51%/95%	((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND study[Title/Abstract]) OR (cohort[Title/Abstract] AND studies[Title/Abstract]))
Prognosis	sensitive/broad	90%/80%	(incidence[MeSH:noexp] OR mortality[MeSH Terms] OR follow up studies[MeSH:noexp] OR prognos*[Text Word] OR predict*[Text Word] OR course*[Text Word])
	specific/narrow	52%/94%	(prognos*[Title/Abstract] OR (first[Title/Abstract] AND episode[Title/Abstract]) OR cohort[Title/Abstract])
Clinical Prediction Guides	sensitive/broad	96%/79%	(predict*[Title/Abstract] OR predictive value of tests[MeSH Terms] OR score[Title/Abstract] OR scores[Title/Abstract] OR scoring system[Title/Abstract] OR scoring systems[Title/Abstract] OR observ*[Title/Abstract] OR observer variation[MeSH Terms])
	specific/narrow	54%/99%	(validation[Title/Abstract] OR validate[Title/Abstract])

Clinical Study Categories bibliography

The [Clinical Queries search strategies](#) have been updated based on new evidence from Haynes et al. The current strategies have better performance than their [predecessors](#). Details of methods appear in the references below.

Revised December 2011

- Wilczynski NL, McKibbin KA, Haynes RB. Sensitive Clinical Queries retrieved relevant systematic reviews as well as primary studies: an analytic survey. *J Clin Epidemiol*. 2011 Dec;64(12):1341-9. doi: 10.1016/j.jclinepi.2011.04.007. Epub 2011 Jul 19. [PMID: 21775104](#).
- Lokker C, Haynes RB, Wilczynski NL, McKibbin KA, Walter SD. Retrieval of diagnostic and treatment studies for clinical use through PubMed and PubMed's Clinical Queries filters. *J Am Med Inform Assoc*. 2011 Sep-Oct;18(5):652-9. doi: 10.1136/amiajnl-2011-000233. Epub 2011 Jun 15. [PMID: 21680559](#); [PMCID: PMC3168323](#).
- Wilczynski NL, Haynes RB; QI Hedges Team. Optimal search filters for detecting quality improvement studies in Medline. *Qual Saf Health Care*. 2010 Dec;19(6):e31. doi: 10.1136/qshc.2010.042432. Epub 2010 Jul 29. [PMID: 20671080](#).
- Kastner M, Wilczynski NL, McKibbin AK, Garg AX, Haynes RB. Diagnostic test systematic reviews: bibliographic search filters ("Clinical Queries") for diagnostic accuracy studies perform well. *J Clin Epidemiol*. 2009 Sep;62(9):974-81. doi: 10.1016/j.jclinepi.2008.11.006. Epub 2009 Feb 20. [PMID: 19230607](#); [PMCID: PMC2737707](#).
- Wilczynski NL, Haynes RB. Response to Corrao et al.: Improving efficacy of PubMed clinical queries for retrieving scientifically strong studies on treatment. *J Am Med Inform Assoc*. 2007 Mar-Apr;14(2):247-8. Epub 2007 Jan 9. [PMID: 17213490](#); [PMCID: PMC2213472](#).
- Wilczynski NL, McKibbin KA, Haynes RB. Response to Glanville et al.: How to identify randomized controlled trials in MEDLINE: ten years on. *J Med Libr Assoc*. 2007 Apr;95(2):117-8; author reply 119-20. [PMID: 17443240](#); [PMCID: PMC1852612](#).
- Wilczynski NL, Morgan D, Haynes RB; Hedges Team. An overview of the design and methods for retrieving high-quality studies for clinical care. *BMC Med Inform Decis Mak*. 2005 Jun 21;5:20. doi: 10.1186/1472-6947-5-20. [PMID: 15969765](#); [PMCID: PMC1183213](#).
- Haynes RB, McKibbin KA, Wilczynski NL, Walter SD, Werre SR; Hedges Team. Optimal search strategies for retrieving scientifically strong studies of treatment from Medline: analytical survey. *BMJ*. 2005 May 21;330(7501):1179. doi: 10.1136/bmj.38446.498542.8F. Epub 2005 May 13. [PMID: 15894554](#); [PMCID: PMC558012](#).
- Montori VM, Wilczynski NL, Morgan D, Haynes RB; Hedges Team. Optimal search strategies for retrieving systematic reviews from Medline: analytical survey. *BMJ*. 2005 Jan 8;330(7482):68. doi: 10.1136/bmj.38336.804167.47. Epub 2004 Dec 24. [PMID: 15619601](#); [PMCID: PMC543864](#).
- Wilczynski NL, Haynes RB, Lavis JN, Ramkissoonsingh R, Arnold-Oatley AE; HSR Hedges team. Optimal search strategies for detecting health services research studies in MEDLINE. *CMAJ*. 2004 Nov 9;171(10):1179-85. doi: 10.1503/cmaj.1040512. [PMID: 15534310](#); [PMCID: PMC524948](#).
- Wilczynski NL, Haynes RB; Hedges Team. Developing optimal search strategies for detecting clinically sound prognostic studies in MEDLINE: an analytic survey. *BMC Med*. 2004 Jun 9;2:23. doi: 10.1186/1741-7015-2-23. [PMID: 15189561](#); [PMCID: PMC441418](#).
- Haynes RB, Wilczynski NL. Optimal search strategies for retrieving scientifically strong studies of diagnosis from Medline: analytical survey. *BMJ*. 2004 May 1;328(7447):1040. doi: 10.1136/bmj.38068.557998.EE. Epub 2004 Apr 8. [PMID: 15073027](#); [PMCID: PMC403841](#).
- Bhandari M, Montori VM, Devereaux PJ, Wilczynski NL, Morgan D, Haynes RB; Hedges Team. Doubling the impact: publication of systematic review articles in orthopaedic journals. *J Bone Joint Surg Am*. 2004 May;86(5):1012-6. [PMID: 15118046](#).
- Wong SS, Wilczynski NL, Haynes RB; Hedges Team. Developing optimal search strategies for detecting clinically relevant qualitative studies in MEDLINE. *Stud Health Technol Inform*. 2004;107(Pt 1):311-6. [PMID: 15360825](#).
- Montori VM, Wilczynski NL, Morgan D, Haynes RB; Hedges Team. Systematic reviews: a cross-sectional study of location and citation counts. *BMC Med*. 2003 Nov 24;1:2. doi: 10.1186/1741-7015-1-2. [PMID: 14633274](#); [PMCID: PMC281591](#).

Wong SS, Wilczynski NL, Haynes RB, Ramkissoonsingh R; Hedges Team. Developing optimal search strategies for detecting sound clinical prediction studies in MEDLINE. *AMIA Annu Symp Proc.* 2003;2003:728-32. [PMID: 14728269](#); [PMCID: PMC1479983](#).

Wilczynski NL, Haynes RB; Hedges Team. Developing optimal search strategies for detecting clinically sound causation studies in MEDLINE. *AMIA Annu Symp Proc.* 2003;2003:719-23. [PMID: 14728267](#); [PMCID: PMC1480286](#).

Wilczynski NL, McKibbin KA, Haynes RB. Enhancing retrieval of best evidence for health care from bibliographic databases: calibration of the hand search of the literature. *Stud Health Technol Inform.* 2001;84(Pt 1):390-3. [PMID: 11604770](#).

Haynes RB, Wilczynski N, McKibbin KA, Walker CJ, Sinclair JC. Developing optimal search strategies for detecting clinically sound studies in MEDLINE. *J Am Med Inform Assoc.* 1994 Nov-Dec;1(6):447-58. doi: 10.1136/jamia.1994.95153434. [PMID: 7850570](#); [PMCID: PMC116228](#).

Medical genetics search filters

The [medical genetics](#) searches were developed in conjunction with the staff of GeneReviews: Genetic Disease Online Reviews at GeneTests, University of Washington, Seattle.

Category	PubMed equivalent
Diagnosis	(Diagnosis AND Genetics)
Differential Diagnosis	(Differential Diagnosis[MeSH] OR Differential Diagnosis[Text Word] AND Genetics)
Clinical Description	(Natural History OR Mortality OR Phenotype OR Prevalence OR Penetrance AND Genetics)
Management	(therapy[Subheading] OR treatment[Text Word] OR treatment outcome OR investigational therapies AND Genetics)
Genetic Counseling	(Genetic Counseling OR Inheritance pattern AND genetics)
Molecular Genetics	(Medical Genetics OR genotype OR genetics[Subheading] AND genetics)
Genetic Testing	(DNA Mutational Analysis OR Laboratory techniques and procedures OR Genetic Markers OR diagnosis OR testing OR test OR screening OR mutagenicity tests OR genetic techniques OR molecular diagnostic techniques AND genetics)
Medical Genetics	((Diagnosis AND genetics) OR (Differential Diagnosis[MeSH] OR Differential Diagnosis[Text Word] AND genetics) OR (Natural History OR Mortality OR Phenotype OR Prevalence OR Penetrance AND genetics) OR (therapy[Subheading] OR treatment[Text Word] OR treatment outcome OR investigational therapies AND genetics) OR (Genetic Counseling OR Inheritance pattern AND genetics) OR (Medical Genetics OR genotype OR genetics[Subheading] AND genetics) OR (DNA Mutational Analysis OR Laboratory techniques and procedures OR Genetic Markers OR diagnosis OR testing OR test OR screening OR mutagenicity tests OR genetic techniques OR molecular diagnostic techniques AND genetics))

Computation of similar articles

The neighbors of a document are those documents in the database that are the most similar to it. The similarity between documents is measured by the words they have in common, with some adjustment for document lengths. To carry out such a program, one must first define what a word is. For us, a word is basically an unbroken string of letters and numerals with at least one letter of the alphabet in it. Words end at hyphens, spaces, new lines, and punctuation. The 132 common, but uninformative, words (also known as stopwords) are eliminated from processing at this stage. Next, a limited amount of stemming of words is done, but no thesaurus is used in processing. Words from the abstract of a document are classified as text words. Words from titles are also classified as text words, but words from titles are

added in a second time to give them a small advantage in the local weighting scheme. MeSH terms are placed in a third category, and a MeSH term with a subheading qualifier is entered twice, once without the qualifier and once with it. If a MeSH term is starred (indicating a major concept in a document), the star is ignored. These three categories of words (or phrases in the case of MeSH) comprise the representation of a document. No other fields, such as Author or Journal, enter into the calculations.

Having obtained the set of terms that represent each document, the next step is to recognize that not all words are of equal value. Each time a word is used, it is assigned a numerical weight. This numerical weight is based on information that the computer can obtain by automatic processing. Automatic processing is important because the number of different terms that have to be assigned weights is close to two million for this system. The weight or value of a term is dependent on three types of information: 1) the number of different documents in the database that contain the term; 2) the number of times the term occurs in a particular document; and 3) the number of term occurrences in the document. The first of these pieces of information is used to produce a number called the global weight of the term. The global weight is used in weighting the term throughout the database. The second and third pieces of information pertain only to a particular document and are used to produce a number called the local weight of the term in that specific document. When a word occurs in two documents, its weight is computed as the product of the global weight times the two local weights (one pertaining to each of the documents).

The global weight of a term is greater for the less frequent terms. This is reasonable because the presence of a term that occurred in most of the documents would really tell one very little about a document. On the other hand, a term that occurred in only 100 documents of one million would be very helpful in limiting the set of documents of interest. A word that occurred in only 10 documents is likely to be even more informative and will receive an even higher weight.

The local weight of a term is the measure of its importance in a particular document. Generally, the more frequent a term is within a document, the more important it is in representing the content of that document. However, this relationship is saturating, i.e., as the frequency continues to go up, the importance of the word increases less rapidly and finally comes to a finite limit. In addition, we do not want a longer document to be considered more important just because it is longer; therefore, a length correction is applied. This local weight computation is based on the Poisson distribution and the formula can be found in [Lin J and Wilbur WJ](#).

The similarity between two documents is computed by adding up the weights ($\text{local wt1} \times \text{local wt2} \times \text{global wt}$) of all of the terms the two documents have in common. This provides an indication of how related two documents are. The resultant score is an example of a vector score. Vector scoring was originated by Gerard Salton and has a long history in text retrieval. The interested reader is referred to Salton, Automatic Text Processing, Reading, MA: Addison-Wesley, 1989 for further information on this topic. Our approach differs from other approaches in the way we calculate the local weights for the individual terms. Once the similarity score of a document in relation to each of the other documents in the database has been computed, that document's neighbors are identified as the most similar (highest scoring) documents found. These closely related documents are pre-computed for each document in PubMed so that when you select Similar articles, the system has only to retrieve this list. This enables a fast response time for such queries.

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. 2023 Aug 24;389(8):687-699.

doi: 10.1056/NEJMoa2304146. Epub 2023 Jul 23.

Pitavastatin to Prevent Cardiovascular Disease in HIV Infection

[Steven K Grinspoon](#)¹, [Kathleen V Fitch](#)¹, [Markella V Zanni](#)¹, [Carl J Fichtenbaum](#)¹, [Triin Umbleja](#)¹, [Judith A Aberg](#)¹, [Edgar T Overton](#)¹, [Carlos D Malvestutto](#)¹, [Gerald S Bloomfield](#)¹, [Judith S Currier](#)¹, [Esteban Martinez](#)¹, [Jhoanna C Roa](#)¹, [Marissa R Diggs](#)¹, [Evelynne S Fulda](#)¹, [Kayla Paradis](#)¹, [Stephen D Wiviott](#)¹, [Borek Foldyna](#)¹, [Sara E Looby](#)¹, [Patrice Desvigne-Nickens](#)¹, [Beverly Alston-Smith](#)¹, [Jorge Leon-Cruz](#)¹, [Sara McCallum](#)¹, [Udo Hoffmann](#)¹, [Michael T Lu](#)¹, [Heather J Ribaldo](#)¹, [Pamela S Douglas](#)¹; [REPRIEVE Investigators](#)

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Abstract

Background: The risk of cardiovascular disease is increased among persons with human immunodeficiency virus (HIV) infection, so data regarding primary prevention strategies in this population are needed.

Methods: In this phase 3 trial, we randomly assigned 7769 participants with HIV infection with a low-to-moderate risk of cardiovascular disease who were receiving antiretroviral therapy to receive daily pitavastatin calcium (at a dose of 4 mg) or placebo. The primary outcome was the occurrence of a major adverse cardiovascular event, which was defined as a composite of cardiovascular death, myocardial infarction, hospitalization for unstable angina, stroke, transient ischemic attack, peripheral arterial ischemia, revascularization, or death from an undetermined cause.

Results: The median age of the participants was 50 years (interquartile range, 45 to 55); the median CD4 count was 621 cells per cubic millimeter (interquartile range, 448 to 827), and the HIV RNA value was below quantification in 5250 of 5997 participants (87.5%) with available data. The trial was stopped early for efficacy after a median follow-up of 5.1 years (interquartile range, 4.3 to 5.9). The incidence of a major adverse cardiovascular event was 4.81 per 1000 person-years in the pitavastatin group and 7.32 per 1000 person-years in the placebo group (hazard ratio, 0.65; 95% confidence interval [CI], 0.48 to 0.90; P = 0.002). Muscle-related symptoms occurred in 91 participants (2.3%) in the pitavastatin group and in 53 (1.4%) in the placebo group; diabetes mellitus occurred in 206 participants (5.3%) and in 155 (4.0%), respectively.

Conclusions: Participants with HIV infection who received pitavastatin had a lower risk of a major adverse cardiovascular event than those who received placebo over a median follow-up of 5.1 years. (Funded by the National Institutes of Health and others; REPRIEVE ClinicalTrials.gov number, [NCT02344290](#)).

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Figures



Figure 1.. Treatment Effect of Pitavastatin on...

Figure 1.. Treatment Effect of Pitavastatin on Major Adverse Cardiovascular Events.

Shown is the incidence...

Figure 1.. Treatment Effect of Pitavastatin on Major Adverse Cardiovascular Events.

Shown is the incidence rate of a major adverse cardiovascular event (MACE) among trial participants with human immunodeficiency virus (HIV) infection in the pitavastatin group and the placebo group and the estimated treatment effect, according to stratified Cox proportional-hazards analysis (Panel A). Also shown are the cumulative incidence of the primary outcome (first MACE) (Panel B) and a key secondary outcome (first MACE or death from any cause) (Panel C). In Panels B and C, the insets show the data on an expanded y axis. At the top of Panel A, the primary outcome of the trial is shown in bold text. Panel A also shows the treatment effect for secondary and supportive analyses. Cox proportional-hazards models were stratified according to sex at birth and the CD4 cell count at screening. Aside from the primary result, the widths of the confidence intervals have not been adjusted for multiplicity and therefore may not be used in place of hypothesis testing. TIA denotes transient ischemic attack.

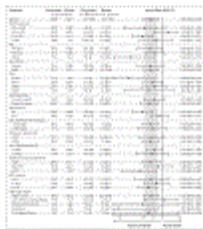


Figure 2.. Treatment Effect on First MACE...

Figure 2.. Treatment Effect on First MACE in Predefined Subgroups.

Each subgroup factor was included...

Figure 2.. Treatment Effect on First MACE in Predefined Subgroups.

Each subgroup factor was included individually in a cause-specific Cox proportional-hazards model that was stratified according to sex at birth and the CD4 count at screening. For reference, the overall treatment effect in the primary analysis is shown at the top of the graph. The widths of the confidence intervals have not been adjusted for multiplicity and therefore may not be used in place of hypothesis testing. The 95% confidence intervals in subgroups with small numbers of events have been truncated, as indicated by arrows. To convert the values for cholesterol to millimoles per liter, multiply by 0.02586. ART denotes antiretroviral therapy, ASCVD atherosclerotic cardiovascular disease, GBD global burden of disease, LDL low-density lipoprotein, and LLOQ lower limit of quantification.

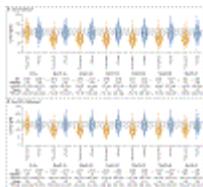


Figure 3.. Fasting Cholesterol Levels.

Shown are...

Figure 3.. Fasting Cholesterol Levels.

Shown are violin plots of data regarding LDL cholesterol (Panel...

Figure 3.. Fasting Cholesterol Levels.

Shown are violin plots of data regarding LDL cholesterol (Panel A) and non-high-density lipoprotein (HDL) cholesterol (Panel B) in the pitavastatin group and the placebo group. In each plot, the mean value is indicated by a circle, the median by a horizontal line, and the interquartile range (Q1–Q3) by the top and bottom of a box; whiskers indicate the 5th and 95th percentiles, and the tapering points reflect the shape of the distribution. For reference, the shaded area indicates the matching interquartile ranges in the pitavastatin and placebo groups at trial entry. To convert the values for cholesterol to millimoles per liter, multiply by 0.02586.

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- [Cardiovascular disease prevention in people living with HIV: from REPRIEVE to a statin of grace.](#)
Vergallo R, Patrono C. Vergallo R, et al. Eur Heart J. 2023 Nov 1;44(41):4308-4309. doi: 10.1093/eurheartj/ehad594. Eur Heart J. 2023. PMID: 37674466 No abstract available.
- [In adults with HIV and low-to-moderate CV risk, pitavastatin reduced MACE over a median 5.1 y.](#)
Selinger S. Selinger S. Ann Intern Med. 2023 Nov;176(11):JC130. doi: 10.7326/J23-0083. Epub 2023 Nov 7. Ann Intern Med. 2023. PMID: 37931263
- [Pitavastatin and Cardiovascular Disease in HIV.](#)
Boettiger DC, Phillips AN, Newall AT. Boettiger DC, et al. N Engl J Med. 2023 Nov 23;389(21):e46. doi: 10.1056/NEJMc2311117. N Engl J Med. 2023. PMID: 37991864 No abstract available.
- [Pitavastatin and Cardiovascular Disease in HIV.](#)
Alam SR, Mureithi M, Ferrand R. Alam SR, et al. N Engl J Med. 2023 Nov 23;389(21):e46. doi: 10.1056/NEJMc2311117. N Engl J Med. 2023. PMID: 37991865 No abstract available.
- [Pitavastatin and Cardiovascular Disease in HIV.](#)
Ioannou P, Filippatos TD, Kofteridis DP. Ioannou P, et al. N Engl J Med. 2023 Nov 23;389(21):e46. doi: 10.1056/NEJMc2311117. N Engl J Med. 2023. PMID: 37991866 No abstract available.
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References

1. Shah ASV, Stelzle D, Lee KK, et al. Global burden of atherosclerotic cardiovascular disease in people living with HIV: systematic review and meta-analysis. *Circulation* 2018;138:1100–12. - [PMC](#) - [PubMed](#)
2. 1. Zanni MV, Schouten J, Grinspoon SK, Reiss P. Risk of coronary heart disease in patients with HIV infection. *Nat Rev Cardiol* 2014;11:728–41. - [PubMed](#)
3. 1. Longenecker CT, Sullivan C, Baker JV. Immune activation and cardiovascular disease in chronic HIV infection. *Curr Opin HIV AIDS* 2016;11:216–25. - [PMC](#) - [PubMed](#)
4. 1. Feinstein MJ, Bogorodskaya M, Bloomfield GS, et al. Cardiovascular complications of HIV in endemic countries. *Curr Cardiol Rep* 2016;18:113. - [PMC](#) - [PubMed](#)
5. 1. Triant VA, Lee H, Hadigan C, Grinspoon SK. Increased acute myocardial infarction rates and cardiovascular risk factors among patients with human immunodeficiency virus disease. *J Clin Endocrinol Metab* 2007;92:2506–12. - [PMC](#) - [PubMed](#)

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Publication types

- Clinical Trial, Phase III
- Randomized Controlled Trial
- Research Support, N.I.H., Extramural

MeSH terms

- Cardiovascular Diseases* / epidemiology
- Cardiovascular Diseases* / prevention & control
- Double-Blind Method
- HIV Infections* / complications
- HIV Infections* / drug therapy
- Humans
- Hydroxymethylglutaryl-CoA Reductase Inhibitors* / therapeutic use
- Middle Aged
- Myocardial Infarction / epidemiology
- Myocardial Infarction / prevention & control
- Quinolines / adverse effects

Substances

- pitavastatin
- Quinolines
- Hydroxymethylglutaryl-CoA Reductase Inhibitors

Associated data

- ClinicalTrials.gov/NCT02344290

Grants and funding

- [UM1 AI069501/AI/NIAID NIH HHS/United States](#)
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