**HIV, herpes simplex virus in the MENA region and the potential utility of a vaccine against *Chlamydia trachomatis***

**1 Status of the HIV epidemic in key populations in the Middle East and north Africa region**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar documented a trend of increasing HIV prevalence among key populations including people who inject drugs, men who have sex with men, and female sex workers in the Middle East and north Africa countries. The study by *Mumtaz et al.,* ‘Status of the HIV epidemic in key populations in the Middle East and north Africa: knowns and unknowns’, was published in *Lancet HIV*. The study reported that although the epidemic continues at a low level in some countries or localities within a country, there is evidence for concentrated epidemics, with sustained transmission at considerable HIV prevalence among people who inject drugs and men who have sex with men in over half of countries in the region with data, and among female sex workers in several countries. The article shed light on gaps in evidence for several countries; whereby the status of the epidemic among key populations remains unknown. Additionally, it highlighted that HIV response in the Middle East and north Africa remains far below global targets for prevention, testing, and treatment.

Citation: Mumtaz GR, Chemaitelly H, AlMukdad S, et al. Status of the HIV epidemic in key populations in the Middle East and north Africa: knowns and unknowns. *Lancet HIV* 2022; 9(7): e506-e16.

Weblink: <https://www.thelancet.com/journals/lanhiv/article/PIIS2352-3018(22)00093-5/fulltext>

**2 HIV incidence and impact of interventions among female sex workers and their clients in the MENA region**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar estimated a total of 14,604 new HIV infections among female sex workers, clients, and spouses in 12 Middle East and North Africa countries in 2020. This sum constituted 28.1% of 51,995 total new HIV infections estimated in all adults in these 12 countries combined. The study by *Chemaitelly et al.,* ‘HIV incidence and impact of interventions among female sex workers and their clients in the Middle East and north Africa: a modelling study’, was published in *Lancet HIV*. The study found that although the incidence of HIV is more likely to be detected among female sex workers, it constitutes only a third of HIV incidence in heterosexual sex work networks—the other two-thirds are split among clients and their spouses, who rarely access any HIV programs. The results suggest that clients and their spouses could benefit greatly from expanding coverage of interventions, even if these interventions are delivered only to female sex workers.

Citation: Chemaitelly H, Ayoub HH, Omori R, et al. HIV incidence and impact of interventions among female sex workers and their clients in the Middle East and north Africa: a modelling study. *Lancet HIV* 2022; 9(7): e496-e505.

Weblink: <https://www.thelancet.com/journals/lanhiv/article/PIIS2352-3018(22)00100-X/fulltext>

**3 Economic burden of genital herpes and HIV attributable to herpes simplex virus type 2 infections in 90 low- and middle-income countries**

Researchers from Harvard University and the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar found that genital herpes contributed to US$813.5 million in treatment and productivity losses in 2019 in low- and middle-income countries (LMICs). The study by *Silva et al.,* ‘Estimated economic burden of genital herpes and HIV attributable to herpes simplex virus type 2 infections in 90 low- and middle-income countries: a modeling study’, was published in *PLOS Medicine*. The study found that economic losses due to genital herpes in LMICs can be large, especially when considering the lifelong nature of the disease. It also indicated that quality-of-life losses outweigh spending on treatment and reductions in productivity. Further, it explained that if HSV-2 has contributed to the spread of HIV in LMICs, then nearly one third of antiretroviral costs and HIV-related wage losses can be attributed to HSV-2.

Citation: Silva S, Ayoub HH, Johnston C, Atun R, Abu-Raddad LJ. Estimated economic burden of genital herpes and HIV attributable to herpes simplex virus type 2 infections in 90 low- and middle-income countries: a modeling study. *PLoS Med* 2022; 19(12): e1003938.

Weblink: <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003938#:~:text=In%20the%2090%20LMICs%2C%20genital,billion%20to%20US%2434.5%20billion>).

**4 Status of herpes simplex virus type 2 in Europe**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar found that herpes simplex virus type 2 (HSV-2) seroprevalence in the adult general population of Europe averaged at about 12%. The study by *Alareeki et al*., ‘Epidemiology of herpes simplex virus type 2 in Europe: systematic review, meta-analyses, and meta-regressions’, published in *Lancet Regional Health - Europe*, showed that HSV-2 seroprevalence is declining in Europe over the last three decades. Sexual risk behaviour, age, sex, and subregion within Europe explained a large proportion of the variation in seroprevalence in this continent. HSV-2 accounts for approximately two-thirds of genital herpes cases, yet contribution of HSV-2 infection to genital herpes cases was declining. These findings support the need to invest in HSV-2 vaccine development, and expanded sexual health services.

Citation: Alareeki A, Osman AMM, Khandakji MN, Looker KJ, Harfouche M, Abu-Raddad LJ. Epidemiology of herpes simplex virus type 2 in Europe: systematic review, meta-analyses, and meta-regressions. *The Lancet Regional Health – Europe* 2023; 25.

Weblink: <https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762(22)00254-X/fulltext#%20>

**5 Status of herpes simplex virus type 2 in Canada, Australia, and New Zealand**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar estimated that herpes simplex virus type 2 (HSV-2) seroprevalence among the general population was 10% in Canada and 15% in Australia and New Zealand, combined. The study by *AlMukdad et al.,* ‘Epidemiology of herpes simplex virus type 2 in Canada, Australia, and New Zealand: systematic review, meta-analyses, and meta-regressions’, published in *Sexually Transmitted Diseases*, found no evidence for declines in HSV-2 seroprevalence over time. Sexual risk behaviour, age, and sex were strong predictors of HSV-2 seroprevalence. Two-thirds of genital herpes cases are caused by HSV-2 infection, but HSV-2's contribution appears to be declining yearly in these countries. These findings support the relevance of HSV-2 prophylactic and therapeutic vaccine development, as well as surveillance and further epidemiological research on HSV-2 infection.

Citation: AlMukdad S, Farooqui US, Harfouche M, Aldos L, Abu-Raddad LJ. Epidemiology of herpes simplex virus type 2 in Canada, Australia, and New Zealand: systematic review, meta-analyses, and meta-regressions. *Sex Transm Dis* 2022; 49(6): 403-13.

Weblink: <https://journals.lww.com/stdjournal/Fulltext/2022/06000/Epidemiology_of_Herpes_Simplex_Virus_Typ>

**6 Status of herpes simplex virus type 1 in Australia and New Zealand**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar estimated a herpes simplex virus type 1 (HSV-1) seroprevalence of 85% among healthy adults in Australia. The study by *AlMukdad et al.*, ‘Epidemiology of herpes simplex virus type 1 and genital herpes in Australia and New Zealand: systematic review, meta-analyses, and meta-regressions’, published in *Epidemiology & Infection*, found that HSV-1 seroprevalence appears to be increasing in Australia. The proportion of HSV-1 detection in genital herpes in Australia and New Zealand was relatively high at 31% and appears also to be increasing year by year. The study concluded that HSV-1 epidemiology in Australia and New Zealand appears to be transitioning toward less oral acquisition in childhood, but more genital acquisition among youth.

Citation: AlMukdad S, Harfouche M, Farooqui US, Aldos L, Abu-Raddad LJ. Epidemiology of herpes simplex virus type 1 and genital herpes in Australia and New Zealand: systematic review, meta-analyses, and meta-regressions. *Epidemiol Infect* 2023: 1-23.

Weblink: <https://www.cambridge.org/core/journals/epidemiology-and-infection/article/epidemiology-of-herpes-simplex-virus-type-1-and-genital-herpes-in-australia-and-new-zealand-systematic-review-metaanalyses-and-metaregressions/BD61C680ACCB4FBA808968879CC3999A>

**7. Impact of a potential Chlamydia vaccine in the USA: mathematical modelling analyses**

Researchers at the Infectious Disease Epidemiology Group of Weill Cornell Medicine-Qatar estimated through mathematical modelling that the introduction of a chlamydia vaccine with 50% efficacy against infection acquisition by 2025, along with achieving 80% coverage by 2035 among individuals aged 15–49 years, could lead to a reduction in prevalence, incidence rate, and annual new chlamydia infections by 36.3%, 38.8%, and 35.8%, respectively, by 2035. This could prevent 11,346,000 chlamydia infections by 2035 and 31,427,000 by 2050. The number of vaccinations needed to prevent one infection decreased over time, from 17.7 by 2035 to 12.0 by 2050. Additionally, targeting specific population groups, such as the 15–19 age group and high-risk populations, reduced the number of vaccinations needed to prevent one infection. The study, conducted by Makhoul et al. and titled 'Impact of a potential chlamydia vaccine in the USA: mathematical modeling analyses,' was published in BMJ Public Health. The findings underscore that a moderately efficacious chlamydia vaccine can significantly reduce infection rates and control the disease burden, and targeting specific populations can maximize cost-effectiveness.

Citation: Monia Makhoul, Houssein H Ayoub, Susanne F Awad, Hiam Chemaitelly, Laith J Abu-Raddad - Impact of a potential Chlamydia vaccine in the USA: mathematical modelling analyses: *BMJ Public Health* 2024;2:e000345.

Weblink: <https://bmjpublichealth.bmj.com/content/2/1/e000345>