Kaposi Sarcoma in the United States: Understanding Disparate Risk

Anne S. Reiner, MPH,* Katherine S. Panageas, DrPH

Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY, USA

*Correspondence to: Anne S. Reiner, MPH, Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, 485 Lexington Ave, 2nd Fl, New York, NY 10017, USA (e-mail: reinera@mskcc.org).

The epidemiologic and medical communities have witnessed a parallel story of HIV/AIDS and Kaposi Sarcoma (KS) unfold for the better part of 4 decades. Prior to the 1980s, KS was rare in the United States (1). Following the onset of the HIV/AIDS epidemic, incidence of KS rose steeply (2) and the two became inextricably linked with KS becoming an AIDS-defining condition (3).

In the 1990s, KS incidence sharply declined, which was attributed to a decrease in HIV/AIDS-related immunosuppression due to both the introduction of antiretroviral therapy (4) and how the community of men who have sex with men (MSM) responded to the HIV/AIDS epidemic (5), reducing the number of unprotected sex acts with new partners, the latter altering the transmission of HIV (6).

Recently, more nuanced trends of HIV and KS have emerged relating to age, sex, race, and geography. Overall, both HIV (7) and KS (8) incidence have been decreasing. However, incidence has been increasing for subgroup populations. Studies of HIV infections have shown that although rates are decreasing for most transmission groups, young men, particularly MSM (7) and men in the South (9), are experiencing increases in HIV incidence. Similarly, although KS incidence in persons living with HIV is decreasing (8), the literature is beginning to reveal subpopulations where this is not borne out. Incidence is stable for young, Black persons living with HIV (8), and incidence is rising for Black men living in the South (10). In this issue of JNCIS, Suk et al. (11) further elucidate who is most at risk of KS, an issue of critical importance for targeting HIV prevention, early HIV diagnosis, and early HIV treatment.

In their article (11), Suk and colleagues use the National Program of Cancer Registries (NPCR) (12) and Surveillance, Epidemiology, and End Results (SEER) (13) Program Database, which provide deidentified, population-based cancer incidence data across the entire US population. The NPCR and SEER Program are surveillance systems well suited to investigate several facets of cancer not limited to incidence, prevalence, survival, temporal trends, and subgroup patterns, all with the goal of advancing epidemiologic knowledge and informing clinical inquiries. Since its inception in the early 1970s, SEER has broadened geographical coverage over time and is considered the gold standard in rigorous, high-quality data collection (14).

Coupled with the NPCR, which was established in 1992, these nationally representative, rich data sources are uniquely positioned to investigate who is at highest risk for specific cancers like KS so that health-care resources can be efficiently allocated for those who most require it.

From 2001 to 2018, Suk et al. (11) reported using NPCR and SEER data showing that the KS incidence rate statistically significantly decreased by 3.5% per year in young, non-Hispanic White men but statistically significantly increased 1.5% per year in young, non-Hispanic Black men, among whom, those living in the South experienced a statistically significant 3.3% per year increase in KS incidence whereas their non-Southern counterparts experienced no change.

To complement these results, Suk et al. (11) examined the birth cohort effect across 16 birth cohorts to more deeply understand the time trends for KS in young, non-Hispanic Black men using age-period-cohort (APC) analysis. APC can be indispensable in the epidemiologic interrogation of longitudinal data (15). In particular, cancer registries follow a cohort of cohorts, and using APC can illuminate changes that are not always detectable with other epidemiologic study designs (16). Among non-Hispanic Black men in the South, those born in recent years had a twofold higher risk of KS compared with those born in earlier years. This was not true of non-Hispanic Black men in non-Southern regions, where no birth cohort differences were observed (11).

Suk and colleagues (11) have identified a very specific, targetable subpopulation at highest risk of Kaposi Sarcoma: young, non-Hispanic Black men in the Southern United States, particularly those born in more recent years. Although NPCR and SEER do not collect information on HIV or AIDS, we can make some reasonable inferences based on prior observations from the literature. Because approximately 90% of KS cases in men are concomitantly in men with HIV/AIDS (17) and because it has also been shown that HIV incidence has increased in young, non-Hispanic Black MSM in the South (9), it is likely that the observed increase in KS shown by Suk et al. (11) is caused by rising HIV rates, both diagnosed and undiagnosed (7). Moreover, in general, Southern states have larger proportions (18) of uninsured people, and uninsured rates are also higher for Black people than White people (19), which inevitably affects health-care...
use. And, notably, Black MSM have been shown to have less HIV testing, more undiagnosed HIV, and later diagnosed HIV, all associated with structural health-care service and societal barriers such as HIV-related stigma, discrimination, and poverty, which occur at high levels in the South, particularly in resource-poor locales (20).

The contribution of HIV diagnoses in people who inject drugs cannot be discounted. Of the HIV diagnoses attributed to drug injection in 2018, the Southern US contributed to almost 40% (21). The opioid epidemic, which has quintupled drug overdose deaths since 1999 (22), has also incited an increase in diseases associated with injection drug use (23). Community-based syringe services programs (SSPs) are successful in providing counseling, testing, and sterile injectors and allowing for the safe disposal of used injectors (24). People who use SSPs are threefold more likely to stop using drugs and fivefold more likely to enter drug treatment than people who do not use SSPs (23). During the study by Suk et al. (11), in 2008, there were several Southern states that did not have a single SSP statewide, including Georgia, Alabama, Mississippi, South Carolina, Tennessee, and Kentucky (25). Even today, some Southern states do not have state laws removing barriers to the legality of SSPs, including Alabama and Mississippi (26). In general, SSPs are least likely to be located in rural areas and Southern states (27,28).

Aggregate incidence trends of HIV and KS portray an encouraging narrative, but Suk et al. (11) are to be congratulated for the important subpopulation for whom there also exists considerable outcome disparities (10,20).

Funding

This work was supported by the US National Institutes of Health (P30 CA008748).

Notes

Role of the funder: The funder had no role in this editorial.

Disclosures: The authors have no disclosures.

Author contributions: Conceptualization, writing—original draft, writing—review and editing: ASR, KSP.

Data Availability

No data were generated or analyzed for this editorial.

References

1. Biggar RJ, Horm J, Fraumeni JF Jr, Greene MH, Goedert J. Incidence of Kaposi’s sarcoma and mycosis fungoides in the United States including Puerto Rico, 1973-81. J Natl Cancer Inst 1984;73(1):89-94.

2. Jaffe HW, Bregman DJ, Selik RM. Acquired immune deficiency syndrome in the United States: the first 1000 cases. J Infect Dis 1983;148(2):339-345. doi: 10.1093/infdis/148.2.339.

3. Centers for Disease Control and Prevention. 1993 revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR Recomm Rep. 1992;41:1-19.

4. Hernández-Ramírez RU, Shieh MS, Dubrow R, Engels EA. Cancer risk in HIV-infected people in the USA from 1996 to 2012: a population-based, registry-linkage study. Lancet HIV. 2017;4(11):e495-e504. doi: 10.1016/S2352-3018(17)30125-X.

5. Aidsd SM, Joseph JC, Ostrow DG, Tal M, Schwartz SA. Relapse in sexual behavior among homosexual men: a 2-year follow-up from the Chicago MACS/CCS. AIDS. 1991;5(6):757-760.

6. Ellum MA, Jemal A, Mbuliaye SM, Devesa SS, Biggar RJ. Trends in Kaposi’s Sarcoma and non-Hodgkin’s lymphoma incidence in the United States from 1973 through 1998. J Natl Cancer Inst. 2002;94(16):1210-1211. doi: 10.1093/jnci/94.16.1204.

7. Singh S, Song R, Johnson AS, McCray E, Hall HI. HIV incidence, prevalence, and undiagnosed infections in US men who have sex with men. Ann Intern Med. 2018;168(10):685-694. doi: 10.7326/M17-2092.

8. Luo Q, Johnson AS, Hall HI, Caboon EX, Shieh M. Kaposi Sarcoma rates among persons living with human immunodeficiency virus in the United States: 2008-2016. Clin Infect Dis. 2021;73(7):e2226-e2233. doi: 10.1093/cid/ciaa999.

9. Prejean J, Tang T, Hall HI. HIV diagnoses and prevalence in the southern region of the United States, 2007-2010. J Community Health. 2013;38(3):414-426. doi: 10.1007/s10900-012-9633-1.

10. Roys CE, Chae MS, Amriin ES, et al. Disparities in Kaposi sarcoma incidence and survival in the United States: 2000-2013. PLoS One. 2017;12(8):e0182750. doi: 10.1371/journal.pone.0182750.

11. Suk R, White DL, Knights S, Nijhawan A, Deshmukh AA, Chiao EY. Incidence trends of Kaposi sarcoma among young Non-Hispanic Black men by US Regions, 2001-2018. JNCI Cancer Spectrum. 2022. doi: 10.1093/jnci/djaa099.

12. Centers for Disease Control and Prevention. National program of cancer registries. http://www.cdc.gov/cancer/npcr/about.htm. Accessed September 29, 2022.

13. National Cancer Institute. Surveillance, Epidemiology, and End Results Program. http://seer.cancer.gov. Accessed September 29, 2022.

14. Royse KE, Chaer FE, Amriin ES, et al. Disparities in Kaposi sarcoma incidence and survival in the United States: 2000-2013. PLoS One. 2017;12(8):e0182750. doi: 10.1371/journal.pone.0182750.

15. Foloff TR. Understanding the effects of age, period, and cohort on incidence and mortality rates. Annu Rev Public Health. 1991;12:425-457. doi: 10.1146/annurev.pa.12.050191.002323.

16. Rosenberg PS, Anderson NL. Age-period-cohort models in cancer surveillance: research for prime time? Cancer Epidemiol Biomarkers Prev. 2011;20(7):1263-1268. doi: 10.1158/1055-9965.EPI-11-0421.

17. Peprah S, Engels EA, Horner MJ, et al. Kaposi sarcoma incidence, burden, and prevalence in United States people with HIV, 2000–2015. Cancer Epidemiol Biomarkers Pre. 2021;30(9):1677-1673. doi: 10.1158/1055-9965.EPI-21-0008.

18. Kaiser Family Foundation. Health insurance coverage of the total population. https://www.kff.org/other/state-indicator/total-popoluation/. Accessed October 12, 2022.

19. Kaiser Family Foundation. Health coverage by race and ethnicity, 2010-2019. https://www.kff.org/racial-equity-and-health-policy/issue-brief/health-coverage-by-race-and-ethnicity/. Accessed October 12, 2022.

20. Reif SS, Whitten K, Wilson ER, et al. HIV/AIDS in the Southern USA: a disproportionate epidemic. AIDS Care. 2014;26(6):351-359. doi: 10.1080/09540121.2013.824535.

21. Centers for Disease Control and Prevention. HIV Surveillance Report, 2018 Updated. vol. 31. http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Published May 2020. Accessed October 12, 2022.

22. Centers for Disease Control and Prevention. Understanding the opioid overdose epidemic. https://www.cdc.gov/opioids/basics/epidemic.html. Accessed October 12, 2022.

23. Centers for Disease Control and Prevention. Syringe Services Programs (SSPs) fact sheet. https://www.cdc.gov/ssp/syringe-services-programs-factsheet.html. Accessed October 12, 2022.

24. HIV.gov. Opioid crisis is raising risks of HIV and other infectious diseases. https://www.hiv.gov/federal-response/policies-issues/syringe-services-programs. Accessed October 12, 2022.

25. Guardino V, D’Arilas D, Arasteh K, et al. Centers for Disease Control and Prevention, National Center for HIV viral hepatitis STD and TB prevention. Syringe exchange programs—United States, 2018. MMWR Morb Mortal Wkly Rep. 2020;59(45):1488-1491.

26. Fernández-Vita MH, Prood NE, Herpelshainer A, Waimberg J, Burris S. State laws governing syringe services programs and participated syringe possession. 2014-2019. Public Health Rep. 2020:135(S1 suppl_123):S128-S135. doi: 10.1177/0033354920921817.

27. Des Jarlais DC, Nugent A, Selberg A, Feeleymer J, Mermin J, Holtzman D. Syringe service programs for persons who inject drugs in urban, suburban, and rural areas—United States, 2013. MMWR Morb Mortal Wkly Rep. 2015;64(48):1337-1341.

28. Canary I, Harri S, Campbell C, et al. Geographic disparities in access to syringe services programs among young persons with hepatitis C virus infection in the United States. Clin Infect Dis. 2017;65(5):514-517.