Map the gap: A novel approach using social network 'big data' to determine the state of the infectious diseases workforce with regards to HIV

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Abstract

Background: The CDC estimates that 1.2 million individuals aged 13 years and older are living with HIV infection in the US, 14 percent of which are undiagnosed. Over the past decade, as the pace of new infections has continued to increase, reimbursement and lack of trained physicians have been cited as major challenges in the battle against HIV. Recently, a less than optimal fellowship match rate is raising concerns for an increased need for specialists in Infectious Diseases (ID). Although there is a general perception that a mismatch exists with regards to the prevalence of HIV and the geographical spread of ID physicians, little data is available.

Methods: De identified data about the number of board certified ID physicians by zip code was obtained from the Doximity physician database which is up to date and refreshed monthly. The location of current Infectious Disease fellowships was obtained from the NRMP public data. These were mapped using Google fusion tables and the results compared to several CDC databases, mainly: Number of HIV diagnoses, number of AIDS diagnoses, death rates (per 100,000), survival rates, federal HIV/AIDS grant funding and GDP as a parameter to assess the financial health of various parts of the US.

Results: A total of 7129 ID physicians and 147 fellowship programs were identified. Our results indicate that ID specialists and fellowship programs tend to be more concentrated in the Northeast and metropolitan areas in the Western regions of the US, which parallel similar patterns noted in other specialties. Survival rates for HIV were also noted to be higher in these locations. HIV prevalence and mortality rates tended to be higher in the Southwestern belt of the US, which correlated with fewer fellowships and physicians along with lower GDP.

Conclusion: The use of this novel social network mapping approach to assess the Infectious Disease physician workforce has the potential of providing real time data regarding their geographical spread. The discrepancies between supply and demand could be addressed by targeted rebalancing interventions that may include additional fellowship spots in 'underserved' areas as well as financial and practice incentives.