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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Introduction

The Centers for Disease Control and Prevention (CDC) estimates that 1.2 million individuals aged 13 years and older are living with Human Immunodeficiency Virus (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.

Although there is a general perception that a mismatch exists with regards to the prevalence of HIV and the geographical spread of Infectious Disease physicians, little data is available.

Methods

The identified data about the number of board certified Infectious Disease physicians by zip code was obtained from the Doximity physician database (Fig.1). The location of current Infectious Disease fellowships was obtained from the National Resident Matching Program public data (Fig. 2). These were mapped using Google fusion tables and compared to several CDC databases, mainly: Number of HIV Diagnoses, number of AIDS Diagnoses, death rates, 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 Infectious Disease physicians and 147 fellowship programs were identified. Our results indicate that Infectious Disease specialists and fellowship programs tend to be more concentrated in the Northeast and metropolitan areas in the Western regions of the US, with parallel similar patterns noted in other specialties. Survival rates for HIV were noted to be higher in these locations. HIV prevalence and mortality rates tend to be higher in the Southwestern belt of the US, which is correlated with fewer fellowships and physicians along with lower GDP.

Discussion

The use of this novel approach to mapping specialist physicians has the potential of providing nearly real time data regarding their geographical spread. There is a discrepancy which exists between the spread of Infectious Disease physicians and:

1. Diagnosis rates of HIV/AIDS.
2. Prevalence of HIV/AIDS.
3. Survival rate of HIV/AIDS.
4. Mortality of HIV/AIDS.
5. Percentage spending on HIV/AIDS.
6. Geographical differences in GDP.

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.

References

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