**COVID-19 Vaccine Hesitancy and the Rural-Urban Divide: A Preliminary Analysis**

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Over the past year, over 26 million Americans have contracted coronavirus disease 2019 (COVID-19) and more than 440,000 have died from it (Johns Hopkins University and Medicine, 2021). Vaccination will protect those who are at high risk for complications from the virus as well as prevent its spread (Baden et al., 2021). Resurgence of vaccine-preventable diseases in recent years has been attributed to vaccine refusal (Phadke et al., 2016). With several vaccines for COVID-19 now available, we need to reverse vaccine mistrust as much as possible. As a first step, we must identify those at risk for vaccination hesitancy and their reasons for potential refusal.

Previous research suggests that vaccine hesitancy stems from concerns about safety, risk, effectiveness, cost, and accessibility (Latkin, et al., 2021; Wilder-Smith & Qureshi, 2020). Racial and ethnic minorities in particular have higher vaccine hesitancy than white Americans due in part to (historically well-founded) mistrust of healthcare, scientific data, and public health officials (Khbchandani et al., 2021). Less is known about vaccination hesitancy in rural communities, however (though see Fisher et al., 2020; Kirzinger et al., 2021). We surveyed the urban and rural regions of northern Kentucky to assess protective practices, understanding of Covid-19 risk, attitudes toward vaccination, and trusted sources for medical information.

The 246 square mile area of northern Kentucky comprises eight counties, along with 54 towns and considerable unincorporated expanses. The three northern most counties contain 85% of the region’s population in primarily urban centers, while the remaining counties to the south are predominantly rural (NKYADD, 2019). Even though the region is socially conservative, there are approximately equal numbers of Republicans and Democrats registered in each county.

The survey was completed by 496 adults. Rural classification was determined by zip code using Federal Office of Rural Health Policy criteria. Race (92.9% white) and age distribution matched the region. Women and those with a college education were overrepresented. Responses were compared for urban and rural respondents using Chi square tests dichotomizing variables as positive (very likely and somewhat likely) or negative (neutral, not likely, and definitely not).

There were no significant differences between urban and rural responses in reported rates of diagnosis or testing, knowledge about mechanisms for disease spread, or impact on personal income. Nor were there any differences in reported plans to get the flu vaccine. Approximately 40% of both urban and rural respondents knew someone who had died from COVID-19 complications.

Despite these similarities, while over 70% of urban respondents believe that they are at risk for getting COVID-19, only half of rural respondents do (p<0.02). In addition, almost 70% of urban respondents, but only 43% of rural respondents, believe that COVID-19 is a serious threat to their health (p<0.00). While almost 90% of urban respondents believe that masks are effective against preventing the spread of COVID-19, less than half of rural respondents do(p<0.00). Similarly, almost 90% of urban respondents, but just over half of rural respondents, believe that social distancing is effective (p<0.00).

Over 80% of urban respondents, but less than half of rural respondents, are likely to get the vaccine (p<0.00). Over 75% of urban respondents, but only 43% of rural respondents, believe that the vaccine is protective against COVID-19 (p<0.00). Only 4% of urban respondents believe that the vaccine is unsafe, compared to almost 30% of rural respondents (p<0.00). And 11% of urban respondents believe that the side effects of the vaccine would be more serious than getting COVID-19 itself, versus over half of rural respondents (p<0.00).

 To identify sources of information trusted by respondents, survey questions included such sources as personal physician, health department, medical associations, the governor of Kentucky, pharmacists, faith leaders, and friends or family. A majority of urban residents are likely to follow recommendations from the Kentucky governor, the district health department, their personal doctor, and their pharmacist. Less than half trust the federal government, faith leaders, and their friends or family as sources of information. With the single exception of their personal physicians, the majority of rural residents trust none of the sources. While there is still a significant difference between the 54% of rural residents who would follow their doctors’ COVID-19 advice and the 86% of urban residents (P<0.00), personal physician is also the person to which over half of the rural residents were willing to listen.

 There is concern that COVID-19 vaccination rates will be insufficient to achieve herd immunity (Mello, Silverman, & Omar, 2020), which is only increasing due to the new, more transmissible variants of the virus wending their way across the planet. Rural residents in the United States mistrust most expert sources of information and they draw different conclusions about level of personal risk – both from COVID-19 and from a vaccine – even though their personal experiences around the virus are not significantly different from urban residents. But this survey did reveal a potential path forward in reaching this population. Because their primary trusted sources of health information are personal physicians, information about Covid-19 and vaccination against it should primarily be disseminated using that channel. Less emphasis should be placed on community leaders, politicians, friend circles, or the faith community.

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