

Quantitative, Data-Driven Systems Analysis and Modeling to Improve Access to Healthcare Among Native American Communities in Rosebud, SD

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The Sicangu Lakota Oyate (Rosebud Sioux) tribe has a life expectancy that is ten years shorter than the national average and five years shorter than other indigenous communities. The Rosebud healthcare system faces limited resources, 20% hospital understaffing, and long-standing historical trauma. Furthermore, their Indian Health Services (IHS) hospital was shut down in 2015 for failure to meet the Center of Medicare and Medicaid Services' criteria for standards of care, and the surgery and obstetric units have remained closed. There is currently no systematic method to evaluate successful interventions for funding and training to mediate these issues and initiate actionable change within the Rosebud healthcare system. We propose a novel data-driven and community-based computational model analyzing resource-dependent outcomes in the Rosebud IHS. The purpose of this model is to simulate the average patient population during one year to test different potential interventions to systematically analyze how patient trust and access to care may be improved through targeted interventions. Application of the model to specific patient and staffing barriers indicates, through quantitative results, that the number of appointments available at the outpatient ward, access to family-care, transportation, and historical trauma are key areas that impact patient access. These quantitative predictions are consistent with the recommendations presented in the Community Health Profiles, such as the increased support for transportation and expanded medical services. This model will lay the groundwork for the utilization of similar computational models in other marginalized communities seeking to analyze and improve patient access and trust.

