ANALYSIS OF THE EFFECTIVENESS OF STUDENT-RUN FREE CLINICS IN THE INLAND EMPIRE: PATIENT PERSPECTIVE

By

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ABSTRACT

Problem:

There are many individuals residing in the Inland Empire who lack health insurance and suffer from a variety of social determinants, making access to healthcare difficult. Student-run free clinics serve as part of an organized safety network to help combat the low accessibility of healthcare. This is done by hosting clinical events at publicly accessible locations where basic necessities, information, and medical consultations are provided. However, there is no clear, developed model that assesses whether these student-run free clinics are effective and are achieving their stated goals.

Approach:

The purpose of the research is to analyze the effectiveness of student-run free clinics, and in this report, to investigate how these clinics commonly support and engage with certain patient populations, such as the underinsured, unhoused, and unemployed populations. We hypothesize that student-run free clinics are an effective means of providing baseline care, addressing health inequities, and facilitating enrollment into long-term care for the underserved communities. Through our research of previously established studies and literature, we found that student-run free clinics have the capability to improve their efficiency through the implementation of community-based interventions that are collected via a needs assessment (Lee et al., 2017). Additionally, studies indicated the necessity for the integration of patient-centered care and strategies to enhance clinical outcomes and satisfaction (Platonova et al., 2016). Finally, student-run free clinics are generally acknowledged as requiring improvements that address patient concerns, such as long waiting times and information privacy (Lawrence et al., 2015). To evaluate our determined effectiveness of student-run free clinics, we proposed a proof of concept

in the form of a qualitative survey to the various stakeholders of these organizations. These stakeholders being the patients, undergraduate student volunteers, medical students, and clinicians. The survey consists of a series of open-ended questions tailored for each stakeholder to answer as a reflection to whether the organization is obtaining the specific aspects to be considered effective.

Outcomes:

Initial drafts of the survey model and questions were further refined and simplified to improve the overall presentation and purpose of the model. In addition to this, we had the opportunity to meet with various medical students and faculty to discuss the model and receive their opinions about the questions being presented. We found that through these discussions, we were able to deduce that various questions were potentially too broad, the model requires framed questions that allow the stakeholder to be unbiased, and that the survey could provide supporting information to establish a common understanding for the stakeholders.

Next Steps:

Future steps for the project include a continued effort to implement improvements and refine the survey questionnaire and the overall presentation of the model. Additionally, we will work to explore IRB approval options so that data collection can begin on the various student-run free clinics active in the Inland Empire. By doing this, we hope to eventually provide a functional model that can be utilized to support student-run free clinics in the Inland Empire.

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INTRODUCTION

The Inland Empire is a region within Southern California that spans different counties, such as Riverside and San Bernardino County. With a majority Latino population alongside a significant African American, Asian, and other marginalized populations, the region reflects a pattern of inequality shaped by various socioeconomic status, racial and cultural factors, and other social determinants. Residents of the Inland Empire experience inadequate access to care or preventative services and a disproportionately higher rate of chronic diseases, such as diabetes and cardiovascular complications. These disparities are further compounded by lower average household income and educational attainment in comparison to other areas of Southern California. Additional factors that drive these issues include environmental factors and shortages of physicians that serve the medically underserved communities. As a result, many individuals face delayed access to care, leading to overall worse health outcomes. To combat such issues within the region, many programs and organizations have been introduced as part of the "safety-net" system. A specific organization that is part of this system is known as student-run free clinics, which aim to provide fundamental access to healthcare and social services to those in need in the community. Specifically, in the Inland Empire, there are Riverside Free Clinic, Inland Empire Street Medicine, and Coachella Valley Free Clinic that are run by various practitioners, current medical students, and undergraduate volunteers. While services that are offered at student-run free clinics are universally accepted and are generally agreed to be impactful in the community, there are gaps in the current literature that provide a model that analyzes the effectiveness of these student-run free clinics from multiple different perspectives. A significant amount of the established research inquiries about how these organizations integrate certain interventional strategies, the necessity to implement patient-centered care, and

general improvements that can be made for the clinics. The purpose of this capstone research is to develop a proof of concept of a qualitative survey model that integrates a determined definition of effectiveness for student-run free clinics from various stakeholders. The aim of this paper is specifically to investigate how these clinics can engage with certain marginalized patient populations and communities in the Inland Empire through the developed model.

LITERATURE REVIEW

Analyzing the current available literature and existing research on healthcare access in the Inland Empire has highlighted persistent health disparities due to multiple driving patterns and factors. A growing body of literature has examined various interventions aimed at addressing these health inequalities, including general improvement strategies and the implementation of patient-centered care. This literature review synthesizes the research on the health disparities relevant in the Inland Empire, patient perspectives on student-run free clinics, and the overall areas where improvement could be facilitated.

Literature Review: Health Disparities in the Inland Empire

Prior literature consistently highlights that the Inland Empire area faces significant and persistent health disparities driven by various structural, environmental, and socioeconomic factors. Research emphasizes that health outcomes in the region are not solely dependent on access to medical care but are rather shaped by the broader social determinants such as economic opportunity, environmental status, social stability, educational attainment, and access to nutritional food (IEHP Foundation., 2025). These non-clinical factors account for a significant portion of chronic health conditions such as diabetes, hypertension, and other preventable diseases in certain ethnic groups in the Inland Empire, which underscores the importance of contextual influences on population health (Nagam., 2025).

One theme in literature was the role of the location where an individual lives in shaping certain health outcomes. According to the IEHP Foundation, there is a system known as the Healthy Places Index or HPI that measures how certain factors can affect population health across different areas. This index system ranked certain counties that are located in the Inland Empire is significantly lower percentiles in comparison to other counties in California (IEHP Foundation., 2025). These findings and reports demonstrate the geographical significance with regard to health disparities in the Inland Empire, further reinforcing the importance of acknowledging place-based inequalities as impacts on overall well-being.

Socioeconomic disadvantages further compound health challenges and concerns since many Inland Empire communities experience higher rates of poverty, limited access to reliable transportation, and reduced availability of healthcare services and providers. All of these factors contribute to an established barrier to consistent and quality care for many members in the community. The affordability of such care is one of the central causes for low-income communities to not seek appropriate and necessary health services in the first place, as they are subjected to high out-of-pocket costs due to being uninsured. Additionally, shortages of primary care physicians and other specialists that serve rural and underserved areas have forced certain individuals to rely on safety-net health systems or expensive emergency services (Nagam., 2025).

Cultural factors, including ethnic standards and language barriers, pose another significant health inequality in the Inland Empire's diversified population. With limited translational language services and lower levels of cultural competency across the health system, many health challenges can be worsened. Combined with having to navigate the complexities of

the United States healthcare system may discourage non-English speaking populations from receiving the benefits and services that they require (Nagam., 2025).

Importantly, the overall literature emphasizes that these health disparities are interconnected and multifactorial. Rather than a single, definitive cause for such inequalities in the Inland Empire, each factor contributes to certain aspects that intersect to produce uneven health outcomes across the region. As a result, improving health equality requires approaches that are comprehensive and community-oriented to address both quality healthcare and social determinants of health. These persistent disparities underscore the critical need for student-run free clinics as part an integral part of the healthcare safety net, as they can provide accessible care to the underserved population and act as a bridge to various other services and systems.

Literature Review: Patient Perspective of Student-Run Free Clinics

Multiple research articles examine student-run free clinics through the patient's perspective, with particular attention to service satisfaction, perceived quality of care, and accessibility to the clinics. Across studies, a consistent finding is that patients report high overall satisfaction with services received at student-run free clinics, particularly in relation to interpersonal aspects of care. Patients frequently rate providers highly in areas such as communication, attentiveness, and the amount of time spent during consultations, suggesting a more patient-centered approach in comparison to more traditional healthcare settings (Kamimura et al., 2014; Kamimura et al., 2016). In some cases, patients perceive clinicians as demonstrating strong listening skills and engagement, which contributes positively to their overall care experience (Lawrence et al., 2015).

The emphasis on interpersonal quality of care emerges as a key strength of student-run free clinics. Studies indicate that patients value the supportive and respectful environment, often

highlighting patience and individualized attention as major contributors to satisfaction (Kamimura et al., 2016). This is particularly significant for underserved populations, who may otherwise experience rushed or impersonal interactions in conventional healthcare systems. As a result, student-run free clinics may play an important role in enhancing patient trust and engagement, which are critical components of effective healthcare delivery.

However, despite these strengths, the literature also identifies several recurring limitations from the patient's perspective, particularly related to clinic operations and access. With long wait times, limited hours of operation, and restricted availability of specialty services being among the most commonly cited sources of dissatisfaction (Kamimura et al., 2016; Lawrence et al., 2015). Patients also report challenges with accessibility, including difficulties with appointment scheduling and service availability, which can undermine the continuity of care. In comparative analyses, while satisfaction with care teams in student-run free clinics is often similar to that of traditional clinics, patients report lower satisfaction in areas such as accessibility and system efficiency (Lawrence et al., 2015).

Concerns regarding privacy and structural organization further complicate patient experiences. Some studies note that patients perceive lower levels of confidentiality in student-run free clinic settings, likely due to the inconsistency of clinical facilities and the educational nature of the clinic environment (Lawrence et al., 2015). These structural challenges highlight tensions between the educational mission of student-run free clinics and the delivery of consistent, patient-centered care.

Overall, the literature suggests that while student-run free clinics are highly valued by patients for their compassion and attentiveness, they face persistent operational and structural limitations that impact accessibility and continuity. These findings indicate that patient

satisfaction in student-run free clinics is largely driven by interpersonal quality rather than systemic efficiency, underscoring the importance of balancing patient-centered care with improvements in clinic organization. Despite strong evidence of positive patient experiences, further research is needed to evaluate how these clinics can sustainably address operational challenges while maintaining high levels of patient satisfaction, particularly in underserved regions such as the Inland Empire.

Literature Review: Student-Run Free Clinic Interventions

A significant portion of the literature examines the various interventions and strategies designed to improve the efficiency and operational output of student-run free clinics with an emphasis on reducing wait times, increasing service capacity, and introducing more thoughtful and personalized care to the community. Across multiple studies, inefficiencies that are most commonly reflected are prolonged visit durations and limited service options, which prompt the implementation of specific quality improvement strategies.

One of the most comprehensive and frequent approaches to identifying areas that require improved clinical efficiencies is through a “needs” assessment. Across multiple studies, these assessments were distributed to patients during clinical hours and consisted of different methodologies, such as interviews, quantitative or qualitative surveys, or researched patient data (Arenas et al., 2019). One of the more regular areas to address was inefficiencies in patient waiting times and clinical staff time management and communication. According to a specific study that administered a needs assessment, many of their patients' expressed concerns were centered around timing and the distribution of clinic resources. The researchers compiled and linked these concerns to particular reasons in the clinic and proposed multiple interventions to address them. Afterwards, they would generate a yearly report of patients' wait times and found

them to be significantly reduced in comparison to wait times before the intervention strategies were introduced (Lee et al., 2017). The interventions that were introduced specifically implemented workflow restructuring, improved staff coordination, increased volunteer knowledge, and expanded service availability. Such systematic changes contributed to a more organized and enjoyable patient experience, showcasing the alignment of clinical efficiency and patient feedback consideration.

Another concept that is common amongst articles within the current literature highlights the necessity of patient-centered care for student-run free clinics. Patient-centered care is a specific approach to healthcare by placing an emphasis on the patient's unique circumstances, needs, values, and specific preferences when making clinical decisions. This is especially significant in certain communities that have strong representations of certain cultural groups and establish reliability and rapport for the clinic. Many studies examined the various levels of patient satisfaction and clinical effectiveness for non-English speaking patients. The findings conclude that the availability of consistent translational services and other social support significantly affected patients' clinical experience as well as their perspective of healthcare in general. Thus, there is an important necessity for student-run free clinics to provide customized treatment and services that are tailored to the community that they serve (Kamimura et al., 2014; Platonova et al., 2016). Additionally, the identification of unique barriers to access in the communities that student-run free clinics serve is just as important as providing the proper treatment in the first place. The causes of certain chronic diseases are more often multi-variable, and understanding the barriers to care will facilitate unique interventions that can address negative health outcomes caused by social determinants (Mallow et al., 2014).

Student-run free clinics have increasingly implemented multi-level interventions that are aimed at improving care delivery to underserved populations. With the addition of workflow improvements inside the clinic, the literature also highlights expanded levels of interventions. These include strengthening referral networks and relations between student-run free clinics, private practices, and hospitals, providing access to more specialized care and resources. This expansion provides a sustainable environment that facilitates continuity and comprehensiveness of care (Davidian & Bloom, 2024). Furthermore, continued partnerships with academic sources and student-run free clinics support the healthcare workforce shortage by expanding the care network and provider availability. Through the integration of underserved patients into broader care networks, these collaborations enhance both clinical output and the general well-being of the community that these clinics serve.

Literature Review: Gaps in Knowledge

The current literature demonstrates the crucial role that student-run free clinics play in addressing healthcare concerns and disparities in underserved populations. Studies consistently highlight how these clinics provide accessible care, connect patients with social or other beneficial resources, and foster patient-centered care for the community. Additionally, research on the numerous and unique interventions that are being implemented into student-run free clinics, such as improved workflow, expanded referrals, and new partnerships, illustrates the potential of these clinics to further improve in efficiency and resource access. Overall, it is evident that the value of student-run free clinics is significant, and they are an important contributing factor to the healthcare safety net.

However, despite these findings, the literature review revealed important gaps in how "effectiveness" is defined and evaluated. Most of the studies assess student-run free clinics

utilizing single metrics such as patient satisfaction, clinical waiting times, or specific outcomes. However, none of these studies integrated these dimensions and aspects into a cohesive report. As a result, there is a limited understanding of how these various components of care interact with each other to provide meaningful and impactful health outcomes. Furthermore, there is insufficient research data that examines patient trajectories in the long term, especially if student-run free clinics were able to successfully transition patients into a sustainable healthcare system or reduce certain health inequities over time.

Another limitation is the lack of contextually specific analysis, as existing research often focuses on evaluating individual clinics or intervention types without accounting for broader factors. These can include regional factors, including unique population needs, social determinants, level of healthcare infrastructure, and availability of accessible health and social resources. This is relevant especially in the Inland Empire, where local disparities are influenced by interactions between socioeconomic conditions, environmental factors, and access to reliable healthcare. Without a developed model, it currently remains unclear how student-run free clinics function within a wider system and how their impacts can be measured and scaled.

These gaps emphasize the need for an integrative and comprehensive model of effectiveness that expands beyond single evaluations and instead measures the multifaceted role of student-run free clinics. Such a model will examine these clinics as not only sources of fundamental healthcare but also as modes for addressing health inequalities that are unique to the applied area and facilitating entry into long-term care systems. This study proposes the development of a proof of concept that incorporates multiple qualitative perspectives to evaluate effectiveness and will highlight areas that require improvement in both short-term and long-term conditions.

METHODOLOGY

The proposed proof of concept involves a qualitative and conceptual design that approaches evaluating the effectiveness of student-run free clinics through their interactions with the underserved population and communities. But rather than relying solely on quantitative measures, this methodology defines effectiveness through multiple aspects, including the quality of baseline healthcare provided, the extent to which health inequalities are addressed, and how enrollment into long-term care can be facilitated. These aspects will be addressed through carefully designed open-ended questions that will be distributed to various stakeholders of student-run free clinics, such as undergraduate student volunteers, medical school students, and practicing clinicians.

As mentioned before, the framework for the proposed model consists of grouping three categories to produce a definition of effectiveness. First, student-run free clinics are examined as reliable providers for baseline healthcare services, which include preventative medicine, diseases managements, and referrals to other resources for the uninsured or underinsured populations. Second, we wanted to evaluate how student-run free clinics address certain health inequalities, particularly those that are associated with the specific region that the clinic serves. Lastly, the model considers the role of student-run free clinics as general entry points for patients to transition into established, long-term care systems. Specifically, how these clinics facilitate the navigation towards sustained healthcare through referrals, connections to facilities, insurance enrollment, and other methods that can integrate underserved patients into the broader medical network.

The development of the proof of concept and the design process was done with the guidance of Dr. Teraguchi. The initial stages of the model began with us proposing questions that

were broad and were similar in terms of style to the current published literature. Through continuous refinement, we were able to narrow down the question types and develop our definition for student-run free clinic effectiveness. Additionally, to further refine the model, informal feedback interviews were conducted by Ethan and myself to multiple stakeholders who possessed relevant experiences with student-run free clinics. These stakeholders included medical students, who formally and currently participate in student-run free clinics, former UCR honors students, and UCR School of Medicine faculty. We presented a slideshow that highlighted a flowchart that started by framing the parameters that we were using to assess the effectiveness of student-run free clinics. Then, the specific stakeholder that would be addressed and the subsequent questions that would be asked of that specific stakeholder.

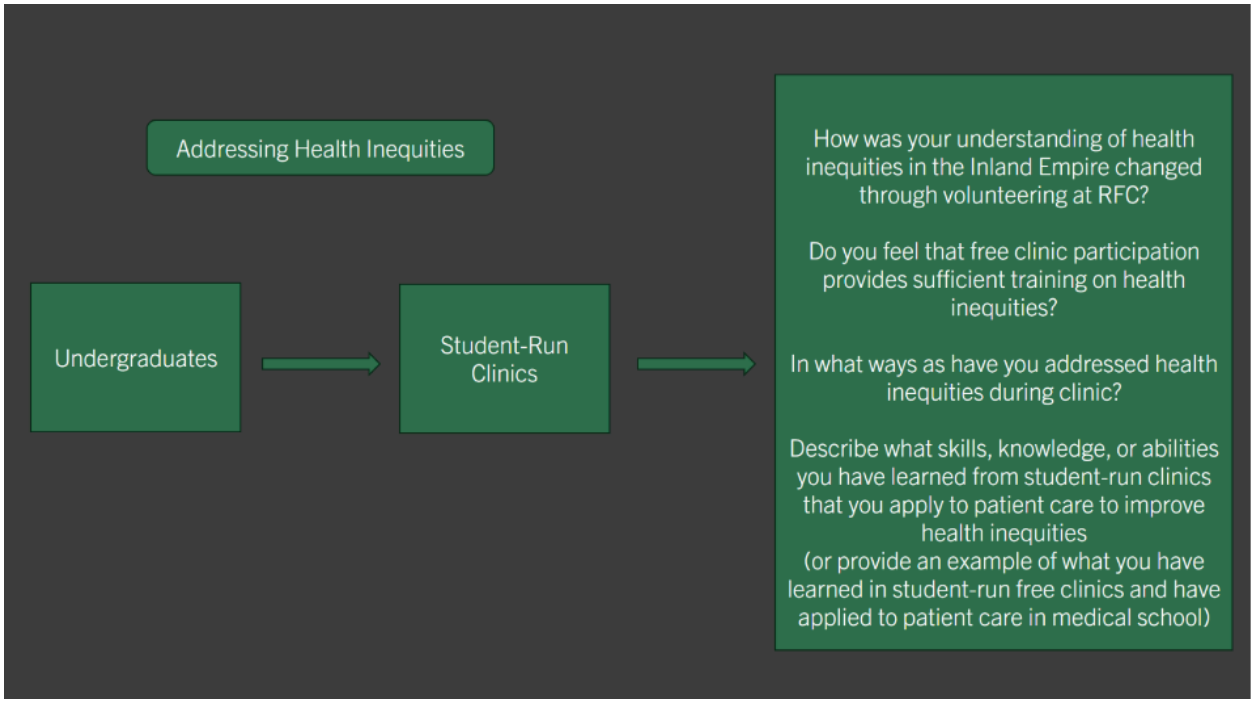

Figure 1: One of the flowcharts that was presented during the stakeholder meetings, showcasing

one of the established parameters, the target audience, and the specific set of questions to be answered.

The interviewees would then present us with their opinions and comments about the parameters and the specific questions that would be asked in the model. A set of UCR School of Medicine students' main concern was how to ensure that personal bias wasn't a factor in the responses to the questions. They pointed out how affiliation and active participation with an organization may introduce factors that can influence the response data, especially from undergraduate student volunteers. Additionally, a faculty director for one of the student-run free clinics in the Inland Empire commented on methods to introduce longevity to the study and tighten the focus on certain questions. They were able to highlight how future work can be accomplished through initial observational studies and eventually expanded towards a survey level with specifically tailored questions to address certain aspects of our hypothesis. The general consensus of the stakeholders that we were able to meet with was that the direction and overarching goal of the project are important, as it addresses a clear need to evaluate how these organizations benefit the local community through multiple elements. However, there were clear features of our approach that required attention and work, such as question ambiguity, response validity, and data collection concerns.

These valuable insights contributed to the critical evaluation and development of the framework. They proposed various changes to unclear or vague questions and assisted us with refining the scope of the model to appropriately answer the research question. Overall, their unique perspectives were instrumental in identifying the practical considerations of the model, potential limitations of the survey questions, and areas that required improvements to achieve the

desired results. The feedback that was obtained during these meetings was then incorporated into subsequent revisions of the questions. resulting in a more adaptable and refined model.

DISCUSSION

This capstone project reinforces the importance of developing a deeper understanding of student-run free clinics' function beyond their immediate role as basic care providers. By proposing a conceptual model or proof of concept that assesses the quality of care, service continuity, system navigation, and health disparity solutions underscores the value of student-run free clinics as not only an integral part of the safety-net system, but also as the potential bridge between sustained healthcare and underserved populations. In doing so, it reinforces the significance of investing in models and frameworks that are able to capture and evaluate their impact on the community.

In the context of the Inland Empire, particularly in the Riverside and San Bernadino County, this potential model has meaningful implications for assisting student-run free clinics to improve operations and clinical outcomes. Given the region's researched and documented history of healthcare disparities, including barriers to reliable care, transportation issues, and physician shortages, the model can be utilized as a useful tool to identify the gaps in care that can further guide future interventions. An example of this would be the implementation of continued care and aid in navigating the healthcare network. These areas would be identified through the results of the model, and student-run free clinics may be better positioned to incorporate changes that can connect patients to long-term care solutions.

In the broader context, the development of this model offers potential for applications beyond the Inland Empire. Since the design of the questions is universal and flexible, the quantitative analysis can be adapted to many different student-run free clinics in other regions.

By providing a well-structured method to assess the effectiveness of these clinics across various conditions, including varying population needs and established infrastructure, it can facilitate the identification of inadequate areas for future improvement. In this sense, the proposed model has the potential to contribute not only to local analysis of the Inland Empire region but also be applicable to a wider examination of optimizing the role of student-run free clinics.

However, during the process of this capstone project, there were several challenges that we encountered. One key limitation was that we could not complete the formal Institutional Review Board (IRB) approval submission due to the complications with the project and the overall timeline of the capstone. This restricted our initial idea of conducting the survey with the student-run free clinics in the Inland Empire, and we shifted the project to the proposal of our model for future applications. Additionally, the process of designing practical and valid survey questions and formats proved to be more complex than anticipated for us. Translating our ideas and parameters of effectiveness into questions that anyone could answer required multiple iterations and was a significant challenge during the project. Finally, learning and practicing how to properly organize researched data took a significant amount of time, but was greatly important for the literature review and analyzing the data from published material.

These challenges required consistent collaboration between our faculty mentor and us, but ultimately contributed to meaningful personal and academic growth. A central learning outcome of this project was the importance of improving through iterations, especially in terms of creating a survey model. Initial versions of our questions clearly lacked operational definitions and clarity, often leaving room for potential bias or confusion with potential respondents. But through feedback and reflection, the model was further simplified and improved in the direction of what it was attempting to answer. Additionally, it became more user-friendly and universal so

that it could be potentially used as an effective research tool for clinical and community implementations. Another learning outcome that we gathered through this process was the appreciation of the academic rigor of research, especially in developing novel and original research models and questions. Getting the experience of attempting to submit for IRB approval offered us the opportunity to reflect on aspects that we otherwise would not have considered in the first place, such as proper data storage and response security.

Overall, the honors capstone project provided valuable insight into the opportunities, applications, and limitations of evaluating the effectiveness of student-run free clinics. It highlighted the importance of developing an adaptable and serviceable model while also allowing us the opportunity to learn the process of designing such studies. Moving forward, the lessons and skills that we learned through this process will be practical and essential in advancing future research data and potentially improving the impact of student-run free clinics in the underserved regions.

FUTURE WORKS

While this study proposes a preliminary proof-of-concept for evaluating the effectiveness of student-run free clinics, continued work and refinement of the model are required to enhance and gauge its validity and application in the real world. Future work should incorporate and focus on iterative development through additional feedback and testing of the model. A critical next step would involve engaging with a broader range of stakeholders, such as additional medical students, undergraduate students, staff, and providers, to obtain deeper perspectives and insights into the model. Incorporating these important perspectives will strengthen the application of the model to effectively assess student run free clinics and future iterations will be more structured to be used in general free clinics. In parallel to this, the development of

formalized feedback tools for future surveys represents an area for future exploration and research. The feedback data obtained can also be used to further improve the general model, but also tailored to address unique inputs for certain communities that a particular student-run free clinic serves. Finally, looking ahead, this project has significant potential for continued research as a future medical student and healthcare provider. With greater access to resources, perspectives, and assistance, future work and study could potentially include institutional review board approval and longitudinal analysis. Ultimately, this honors capstone project represents an initial step toward developing a comprehensive model for understanding student-run free clinic effectiveness. Continued refinement and expanded stakeholder engagement will be essential for transforming the current model state into a practical resource. Through these efforts, future directions of the project can contribute to strengthening the role of student-run free clinics in improving healthcare accessibility and addressing disparities across diverse communities.

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