



PREDICTIVE ANALYTICS

USING ARTIFICIAL INTELLIGENCE FOR HEALTH EQUITY

Zuckerberg San Francisco General Hospital and Trauma Center



SAN FRANCISCO
GENERAL HOSPITAL
FOUNDATION



Care for All: Incorporating Social Determinants of Health into Patient Care

Predictive analytics and other technological innovations have the potential to dramatically improve health outcomes.

Recent innovations in machine learning and artificial intelligence (AI) have made it possible to reliably predict health outcomes. The ability to intervene in an adverse health event, or even prevent that event before it occurs, is a powerful tool in avoiding detrimental health outcomes such as hospital readmission rates and fatalities.

Past predictive models using this technology relied upon limited, incomplete, or biased information, resulting in predictions that were inaccurate or irrelevant for vulnerable and underserved patient communities. The vast amount of population-specific data in electronic medical records, combined with enhancements to machine learning techniques, now enables this technology to create targeted models with increased accuracy that can lower health care costs and improve patient outcomes.

Integral to the success of predictive analytics at Zuckerberg San Francisco General Hospital and

Trauma Center (ZSFG) is the incorporation of social determinants of health.

Treatment at ZSFG encompasses the whole person, not only the immediate medical need. When a patient is also unhoused, incarcerated, or suffering from substance use disorder, their treatment will differ substantially from patients without those social determinants. As ZSFG models have already clearly shown, collecting and incorporating this data into predictive models results in health predictions that are vastly more accurate than previous versions.

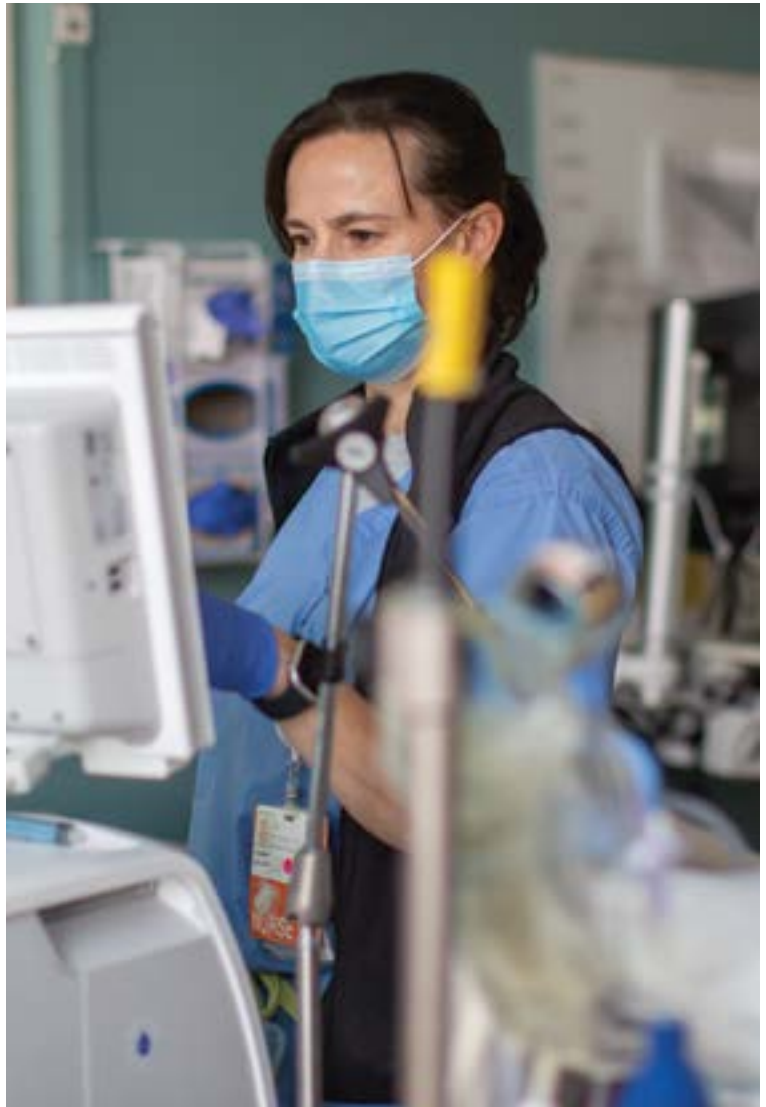
Social determinants of health are the non-medical aspects of a person's life that contribute to their wellbeing. They may include socioeconomic status, degree of food security, housing status, or proximity to conflict.

Predictive Analytics at ZSFG

Predictive analytics and other technological innovations have the potential to dramatically improve health outcomes, and there is perhaps no environment with greater potential for transformation than the so-called safety net systems, like ZSFG, that care for vulnerable and underserved populations. Working with colleagues at the San Francisco Department of Public Health, ZSFG recently completed a multi-year pilot project utilizing predictive analytics to improve its cardiac outcomes. This program utilized advanced machine learning techniques that accurately predicted the risk and cause of readmission and death in heart failure patients.

With a very low margin of error, predictive analytics offers health care providers customized and automated suggestions for the best course of action. When increased risks are attributable to social determinants of health such as housing instability or substance use, ZSFG workflows connect patients to appropriate resources.

Importantly, ZSFG has a standardized screening tool that evaluates patients across 14 different areas of social need, thereby increasing predictive accuracy and lowering adverse health outcomes.



IMPACT

- **13% reduction** in hospital readmission rates
Previously, ZSFG had the worst heart failure readmission rate among safety net hospitals in California—it now has the best
- **6% reduction** in mortality rate for heart failure patients
- **Elimination of the equity gap** between Black/African American patients and the general heart population



You Can Make a Difference

Owing to the notable impact seen in the pilot study, developing predictive analytics platforms for use within other areas of ZSFG is a high priority. By incorporating social determinants of health into machine learning models, the Hospital is able to more quickly and accurately respond to the unique needs of its patients. Deploying this tool more broadly throughout ZSFG and at other safety net institutions will lower adverse health outcomes even further.

The program requires additional funding to scale and sustain this expansion. With strategic investment, there is enormous potential to transform the way in which the very best care is quickly and accurately delivered to those most in need.

San Francisco is the artificial intelligence hub of the world, and **this is an incredible opportunity to utilize the intellectual capital of our region to solve some of its challenges.** An investment in the latest technological innovations at ZSFG will ensure that San Francisco's AI boom is broadly beneficial to the city and set the tone for how this technology is used in coming years. **Your gift will harness the incredible potential of AI and leverage it for good**—the care and wellbeing of all San Franciscans.

We believe in equity, access, and quality health care for all. Will you join us? Learn more at sfghf.org/analytics.



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