

Forecasting prevalence and cost trend of chronic condition progression using an epidemiologic simulation model

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Abstract: *The prevalence of chronic disease continues to increase around the world. While this has been most dramatic in the United States, lifestyle and consequential health risks likely signal that the burden of chronic disease on global economies will continue to increase at an alarming rate. Beyond the cost to provide health care for afflicted individuals, the impact of unhealthy behaviours and chronic conditions and on productivity is substantial. In the United States alone, the top seven chronic ailments are responsible for an estimated annual shortfall of US\$ 1 trillion in lost productivity. Globally, risk factors are estimated to result in US\$ 2 trillion of lost productivity each year. Increasing global prevalence rates of chronic disease will only serve to worsen this problem over time increasing the cost to produce goods and reducing the ability to compete in the global economy. To assess the risk of inaction and estimate the impact of action directed at improving healthy behaviors and modifying risks, an epidemiology-based model was constructed to simulate the incidence and progression of disease over time. The model prospectively simulates the complex relationships that exist between chronic conditions and modifiable behaviors. Based on the calculated increases in disease prevalence, the future impact on the cost related to medical conditions as well as the costs of reduced productivity can be estimated. The projected trajectory of these costs can be altered via the introduction of intervention assumptions that are designed to positively affect modifiable behaviors. Application of this model to a dataset from the United States suggests a total medical savings of \$1,795 per person over a 10-year period, concomitant with a 10% reduction in cancer rates due to smoking cessation, and 5 and 13% reductions, respectively, for obesity and diabetes. Broader application of this model to other countries will reveal even greater opportunity for savings and productivity improvements globally. Use of predictive analytics to forecast future trends (and the ability to curb them) can create powerful insight into the need for programs designed to modify unhealthy behaviors and reduce risk.*

Key Words: Medical Informatics; Predictive Modeling; Epidemiology; Forecasting; Health Care Costs

Sorumlu Yazarın Adresi

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