

## Optimizing diabetes care on a global scale

Diabetes is a major threat to healthy living for hundreds of millions of people worldwide. Type-1 diabetes must be treated with insulin and type-2 diabetes (the more common form) can be treated with lifestyle changes, oral medication, and injectable medicines, including insulin. The rising prevalence of type-2 diabetes is due to complex interactions between genetics and environmental factors. One can manage individual people with diabetes, as well as whole populations of people by preventing the risk for diabetes, as well as the risks for progression of diabetes. By collecting information on diabetes care from different settings around the world, important ideas can be captured, analyzed, and then put together into a new framework to better manage large populations.

Six broad categories of factors that influence diabetes care are biology, culture/lifestyle, socio-economics, politics, education, and research. In fact, in many areas of the world, diabetes care carries a very high economic burden that requires more governmental policy and funding, especially in the areas of technology, information gathering, and adaptation of scientific guidelines. Other important factors that are less consistent globally include high inflation rates, large migrations and cultural changes in a particular region, crime, poverty, attitudes toward health care, and availability of expert clinicians and appropriate medications.

When analyzed more deeply, several properties emerge that could potentially improve the way diabetes care is implemented to achieve better clinical outcomes. First, more knowledge is needed on the economics of prescribing certain medications, effects of lifestyle change, coordination of health care systems, web-based learning, surveys on awareness, behavioral medicine, basic scientific research, and high-quality clinical trials. Second, public health efforts should be enriched with modernized chronic care models, community engagement, better literacy rates, advancing human rights and combatting discrimination, greater access to technology (such as registries), more funding, more lifestyle programs (related to physical activity, stress reduction, and healthy eating), incorporation of religious dictates, and collaboration among government, medical institutions and clinics, and the pharmaceutical industry. Third, these actions must lead to a longstanding, durable effect. This is accomplished through patient education, self-management programs, standardized clinician training, identifying local champions in the community, and even crowdsourcing and telemedicine tools. Scientific guidelines should be adapted across cultures for easy access and use and once again, there needs to be more funding for diabetes research to advance care for all people.

These emergent findings can be put together and synthesized into a core set of recommendations to improve diabetes care on a global scale. First, the knowledge base should be expanded. Each nation should evaluate the region-specific epidemiology, scientific evidence base (particularly regarding biologic causes), and whole population transitions to detect people at higher risk. Then, to devise risk-specific guidelines for screening, diagnosis, prevention, and treatment. Second, the public health model needs to be updated. Each nation should establish a public health strategy

that funds and acquires all the necessary tools for diagnostics, medical treatment, supplies, etc. In addition, there needs to be adequate funding, appropriated by the government and legislative body, to successfully implement culturally-sensitive scientific guidelines, and to develop local metrics to continually evaluate performance and improve these guidelines. Third, there must be enduring commitment to excellence in diabetes care. This can be through education and research, with a focus on how diabetes as a disease affects a particular nation or region at many levels; for example, quality of life, happiness, national security, and commercial productivity.

In conclusion, by analyzing descriptions and data about diabetes care in specific areas of the world, a core set of recommendations applicable on a global scale can be fashioned to improve clinical outcomes. This is only a starting point, but a call for action must be heard since the diabetes epidemic has thus far been quite deaf.

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## **Publication**

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