Diabetes Voice

GLOBAL PERSPECTIVES ON DIABETES

ISSUE 4 DECEMBER 2017

WORLD DIABETES DAY 2017

IDF CONGRESS 2017, ABU DHABI

IDF DIABETES ATLAS 8TH EDITION

IDF Congress 2017

4-8 December
Abu Dhabi

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International Diabetes Federation

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International Diabetes Federation
Promoting diabetes care, prevention and a cure worldwide

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International Diabetes Federation

Our commitment to a world without diabetes

IDF President Shaukat Sadikot

Welcome to the December issue of Diabetes Voice and to the 2017 IDF Congress in Abu Dhabi, United Arab Emirates. If you aren't attending, I hope you will log onto www.idf.org/congress to view the exciting scientific programme we have planned.

With nearly a **half billion people living with diabetes worldwide** today, there is no other more important conference than IDF's biennial Congress where the largest global gathering of diabetes healthcare professionals assembles to hear a consortium of distinguished international speakers share knowledge and raise awareness of diabetes—the number one health epidemic facing our world. For five days, this virtual global village, bringing together IDF Member Associations, healthcare professionals, researchers, industry leaders, policy makers and people with diabetes—all dedicated to diabetes care, prevention and a cure—will be the place to learn the latest findings in diabetes research and best practice. IDF Congress 2017 reflects one very important fact: we have the knowledge and expertise to continue to work towards creating a world without diabetes.

As is the tradition, the General Assembly will convene at the IDF Congress 2017 on 4 December marking the end of my term as IDF President. It has been a very productive term with the assistance of all members of the IDF Board of Directors, IDF Delegates, IDF Staff in Brussels, IDF Member Associations and thousands of volunteers worldwide. The work of IDF's Implementation Plan for 2016-2017 was a transformative year focused on IDF's Global Voice. IDF and its partners spoke with authority and delivered action in a wide range of initiatives covering diabetes care and prevention, epidemiology, statistics, health economics, health education for professionals and citizens, as well as health system reform. Through our collaboration, we have achieved many great initiatives and I'd like to mention a few here.

Developing and implementing authoritative guidelines and standards for care and professional education was a number one priority. In 2016, the IDF School of Diabetes was created to deliver high standard, evidence-based diabetes education for healthcare professionals, people with diabetes and caregivers worldwide. The critical element of IDF's School of Diabetes is to meet the demand for effective diabetes detection, prevention, quality care and treatment strategies with an online portal for healthcare professionals in real-time. In just one year, we have achieved: 1845 learners from 154 countries; 3 certified courses for Primary Care Physicians, Educators and Specialists; and all courses have been accredited by the European Accreditation Council for Continuing Medical Education (EACCME).

In the past year, we issued several guidelines including Clinical Practice Recommendations on the Diabetic Foot and the Management of Type 2 Diabetes and the Global Survey on Access to Essential Diabetes Medicines and Cost Effective Solutions for the Prevention of Type 2 Diabetes. Each of these publications reflects a common

denominator: IDF's mandate to develop policies and resources to raise awareness of the need to effect change at a population level for diabetes prevention and improving care.

It has always been the remit of IDF to fight not only for diabetes access and care but to also combat stigma and discrimination. Our Blue Circle Voices (BCV) initiative goes right to the heart of the challenges of living with diabetes by representing the interests of people living with, or affected by diabetes through a worldwide network of members and other stakeholders. BCV is the global voice of people living with diabetes and draws upon the experiences of people living with diabetes. BCV reflects many of our key core values—solidarity, compassion, cultural sensitivity and collaboration.

Just a few weeks ago, we celebrated the impact of diabetes awareness on World Diabetes Day 2017 with a campaign dedicated to Women and Diabetes And Our Right to a Healthy Future. Over 200 million women live with diabetes today and without affordable and equitable access to care and education this number will continue to rise by the hundreds of millions. Current estimates reported in the *8th Edition of the IDF Diabetes Atlas* state that 21.3 million or 16.2% of live births to women in 2017 had some form of hyperglycaemia in pregnancy, putting both mother and child at risk for type 2 diabetes later in life. The right for women to have access to diabetes prevention and care equates to healthier generations and brighter futures.

In closing, I want to be sure to wish everyone a safe and enjoyable time at the IDF Congress and thank especially the Organizing Committee, chaired by Monira Al Arouj, the Programme Committee, chaired by Nam Cho, the National Advisory Committee, chaired by Abdulrazzaq Al Madani and great appreciation to the Emirates Diabetes Society and Abu Dhabi Health Authority for their assistance and hospitality.

Shaukat Sadikot
IDF President 2016-2017

Rise in type 1 diabetes observed in Hispanic youths

A team led by Elizabeth J. Mayer-Davis from the University of North Carolina at Chapel Hill examined data from the national SEARCH for Diabetes in Youth study, which comprised 11,245 youths with type 1 diabetes and 2,846 with type 2 diabetes. The researchers sought to better understand specific trends in diagnosis rates of diabetes in youth.

For inclusion in the SEARCH study, subjects had to be younger than 20 years old and diagnosed by a physician. Data was collected primarily from five clinical centers in California, Colorado, Ohio, South Carolina and Washington.

Using this data, Mayer-Davis's team calculated annual incidence rates and conducted comparisons among the country's five major racial and ethnic groups: non-Hispanic white, non-Hispanic black, Hispanic, Asian or Pacific Islander, and Native American. This work built on the conclusions of the SEARCH study, partly by looking at diabetes diagnoses over a longer time period.

Key findings:

From 2002 to 2012, the annual increase in diagnosis rates for type 1 diabetes was 1.8 percent; for type 2 diabetes, this figure was 4.8 percent.

Whites had the smallest increase in diagnosis for type 1 diabetes. Diagnoses rose 1.2 percent per year for white youth compared to 2.2 percent annually for black youth.

Hispanic youths had the highest increase in incidence of type 1 diabetes (4.2 percent annually).

White youth did not experience a statistically significant increase in type 2 diabetes incidence between 2002 and 2012.

The type 2 diabetes diagnosis rate for Asian-Pacific Islander youth increased 8.5 percent a year. It rose 8.9 percent a year for Native American youth. There is concern, however, about whether findings for Native American youth can be generalized to the national population because data for this study was collected from youth from a narrow geographic area.

Taking diabetes to heart

In September, the International Diabetes Federation launched Taking Diabetes to Heart, a multi-country study on cardiovascular disease (CVD) awareness and knowledge in people with type 2 diabetes. The results of the survey will support the development of tools, educational resources and policies designed to facilitate implementation of recommendations included in IDF's global report on Diabetes and Cardiovascular Disease. A primary goal of the recommendations is to reduce the burden of CVD among people living with type 2 diabetes.

An online survey has been developed in multiple languages (including English, French, Spanish, Arabic, Chinese, Russian, Hindi, Portuguese, Italian, Dutch, German, Danish, Indonesian, Greek, Macedonian, Swedish, Finnish, Swahili, Korean, Urdu, Vietnamese). The preliminary results of the study will be presented and live streamed at the IDF congress in Abu Dhabi on Wednesday 6th December 2017 at 12.00-1.00 pm local time and Thursday 7th December 2017 at 9.30-10.30 am local time. Please stay tuned and take diabetes to heart!

IDF SACA Region: Douglas Villarroel to give IDF Award Lecture

Douglas Villarroel with his children Diego, Susan and Daniel in the outskirts of Santa Cruz, Bolivia

Douglas Villarroel, Editor-in-Chief of Diabetes Voice and an endocrinologist trained in Bolivia and Mexico, received the distinction of being nominated to give the The Joseph P Hoet IDF Award Lecture on December 7th at the IDF Congress 2017 in Abu Dhabi. Dr Villarroel is the first doctor from Bolivia to be given this distinction. We sat down with Dr. Villarroel to discuss the award and his work in Bolivia.

How did you receive the news of this distinction from the IDF?
I was very pleasantly surprised. I consider it an honour because the IDF is an institution that encompasses all scientific, medical and educational components for the advancement of preventing and curing all types of diabetes. I was greatly humbled that IDF decided to give the award to me as I represent a strong background in the prevention, and treatment of diabetes from the SACA Region.

What will you be presenting?
I will be presenting "Prevention and treatment of diabetes in rural areas: a colossal challenge" which is a primary focus for me professionally.

Can you discuss the advocacy work you are doing in Bolivia today?
I am helping to run a centre located in Palacios, a community located 110 kilometres in the Ichilo province. The care is free, as well as the supply of medicines and laboratory tests. Although our centre is a bit out of the way, we receive dozens of patients every day from all over this region. We have their data, we know where they live, what diseases they have, we give them recommendations so that they have healthy habits and regular checks are carried out. The clinic has satellite internet, crops for healthy food and its own water system. We work in collaboration with Loyola and Northwestern University of the United States and we have been providing healthcare there for 17 years already.

Do you consider that this could be a replicated model?
We are working in the municipality of San José; a town to the east of Santa Cruz, with a Diabetes Prevention Program, which has been declared municipal law and priority for the municipality. The program consists of actions related to healthy eating plans, weight reduction and physical activity for the entire population. It can be done in any municipality, in any part of the country. But for this there has to be a willingness on the part of the health authorities to establish policies that encourage the prevention of diabetes, which is a very important part that is being neglected.

What prevention advice do you give to society in general?
I believe that we all have the power to change our destiny if we change our way of life. Poor lifestyle behaviours are a great threat, but we can alter the risk. Cardiovascular disease is the result of not heeding the threat. Out of every four people with diabetes, three die from a heart attack, because diabetes accelerates the accumulation of fat and blocks blood vessels. Early death is preventable. People need to understand this.

World Diabetes Day 2017: Women and Diabetes

Human blue circle formed in Mérida, Mexico

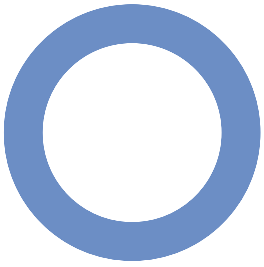
World Diabetes Day 2017 on 14 November focused on raising awareness of the impact of diabetes on women. The campaign, led by the International Diabetes Federation (IDF) and marked by the national members of IDF in over 160 countries, promoted the importance of affordable and equitable access for all women at risk for or living with diabetes to the essential diabetes medicines and technologies, self-management education and information they require to achieve optimal diabetes outcomes and strengthen their capacity to prevent type 2 diabetes.

IDF marked the day with a stakeholder event in Brussels that brought together representatives from government, the health sector and civil society to discuss key issues of importance to the diabetes agenda through the prism of women. Data released in the 8th Edition of the IDF Diabetes Atlas, launched on World Diabetes Day, indicate that over 200 million women are currently living with diabetes. Many face multiple barriers in accessing cost-effective diabetes prevention, early detection, diagnosis, treatment and care, particularly in developing countries. Women with diabetes are more likely to be poor and have less resources, face discrimination and have to survive in hostile social environments. Diabetes is also a serious and neglected threat to the health of mother and child, affecting one in six births and linked to complications during and after delivery.

Speaking at the event, IDF President Dr Shaukat Sadikot said, "Women and girls are key agents in the adoption of healthy lifestyles to prevent the further rise of diabetes and so it is important that they are given affordable and equitable access to the medicines, technologies, education and information they require to achieve optimal diabetes outcomes and strengthen their capacity to promote healthy behaviours."

The event also served to promote IDF's call to action for the 2018 High Level Meeting on NCDs, calling on governments to renew their commitments and increase their efforts towards achieving the agreed targets. These include a 0% increase in diabetes and obesity prevalence; 80% access to essential medicines and devices by 2025; and a 30% reduction in premature mortality from NCDs by 2030.

United by the blue circle, the global symbol for diabetes awareness and logo of World Diabetes Day, IDF's member associations and the wider diabetes community rallied around the theme and key messages of IDF's campaign by organizing a multitude of awareness activities around the world throughout the month of November. Over 900 activities in more than 100 countries were registered on the custom World Diabetes Day online events platform.



world diabetes day

14 November

These included:

- Blue lightings
- Physical activities
- Screenings for type 2 diabetes, gestational diabetes and diabetes complications
- Activities promoting women's health
- Meetings, exhibitions and fairs

A complete overview of World Diabetes Day 2017 activities can be viewed at www.idf.org/wdd-events

Images of World Diabetes Day 2017 activities are available at www.worlddiabetesday.org

Highlights of World Diabetes Day awareness activities organized at the national level are included below.

IDF Europe (EUR) region

Niti Pall

This year the IDF Europe region organised events in three main political decision centres of the European Union (EU) and we reached out to selected Committees of the Council of Europe.

Thanks to a new collaboration with the Committee of the Regions (the European Union assembly of Regional and Local representatives) in Brussels, we organised a successful Diabetes Awareness Day exhibition and blood glucose (BG) testing event on the on 26 September 2017. During World Diabetes week, two important activities took place: a three-day event at various buildings of the European Commission (EC) in Brussels, including an exhibition and BG testing event; and an afternoon debate on "Women and diabetes" at the European Parliament (EP) in Strasbourg, France, complemented by an exhibition and BG screening for Members of the EP and staff.

At all three events, we presented our program IMPACT (the Initiative to Mobilize Parliamentarians to Act to Prevent, Care and Treat diabetes) to pursue our contribution to a more informed political environment, where knowledge and understanding are provided by people living and working with diabetes. The objective is to develop effective policies for people with diabetes and those at risk, and ensure they are adopted, financed, implemented and evaluated. This program is also promoted locally by our group of young advocates who are extremely active during the year. For WDD, they launched the second edition of eurMOVE, a challenge to stay physically active and raise awareness on diabetes with the aim to collect minutes of physical activity equivalent to 365 days until November 14th.

All around the year, we develop news reports and interviews dedicated to international days linked to diabetes for digital publication on our website, social media and direct mail. On the occasion of WDD, IDF

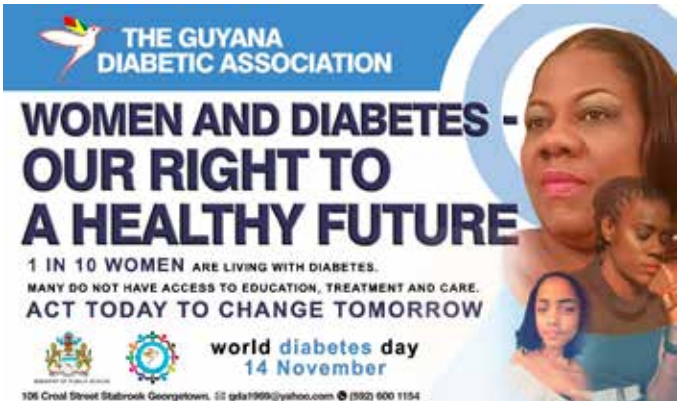
Europe ran a series of four interviews of women having a direct relation with diabetes. Whether women have diabetes themselves or advocate for someone in their family, they all have one thing in common: diabetes is at the centre of their daily life and they are committed to fight for stronger rights and less discrimination.

Finally, on November 14th, we launched a report aimed at identifying gaps in diabetes management which our members contributed to through a survey by suggesting recommendations to improve the lives of people affected by diabetes in Europe.

Niti Pall is the Regional Chair-Elect of IDF Europe.

IDF North America and Caribbean (NAC) region

Glynis Beaton



With 200 million women living with diabetes, it is imperative that women take a stronger role in the fight against diabetes. Girls and women living with diabetes experience a number of challenges in today´s world; power dynamics, gender roles, socioeconomic inequalities that influence vulnerability to diabetes including factors like poor diet and nutrition and physical inactivity. In developing countries women´s access to healthcare services and health seeking behaviors amplify the impact of diabetes on women and their families.

Throughout the IDF North America and Caribbean region, World Diabetes Day (WDD) was celebrated with a number of activities to bring awareness within the region especially the need for more collaboration and funding to support the fight against diabetes with women and girls at the forefront.

Despite the major setback with hurricanes in the region that cost us major interruption and damage, every IDF Member Association made it a priority to focus on women and diabetes this WDD. Barbados hosted the Chair-Elect (NAC Region) on WDD; St. Lucia launched the Blue Circle Magazine "Women and Diabetes." For all of November 2017, Guyana featured a young lady living with diabetes on Facebook for inspirational awareness. The Young Leaders in Diabetes in Guyana hosted 30 women in their magenta "Ladies of Distinction" leadership training for type 1 youths and cancer patients. A French Team Tea Party showcased "Easy management of diabetes," several exhibitions and a walk.

Highlighting women and diabetes this year meant a great deal since women take on the bulk of the weight dealing with diabetes for the entire family. Women take care of their families and work along with the daily stress of life, yet must still be a mother, a sister, an aunt, a cousin, a daughter and a partner— with leadership and compassion. This year more than any other year will give credit to all the work women do for diabetes and its complications. Women deserve the right to a healthy future!

Glynis Beaton is Regional Chair-Elect for the IDF North America and Caribbean region.

IDF Middle East and North Africa (MENA) region

Nizar Albache & Abdul Basit

Since 1991, World Diabetes Day (WDD) is the most important public awareness activity related to diabetes celebrated in more than 160 countries across the globe under the umbrella of International Diabetes Federation (IDF). The theme of WDD 2017 is "Women with Diabetes - our right to a healthy future". IDF Member Associations (MA) in the IDF MENA region (comprised of 22 countries and 30 IDF MAs) have been actively involved in celebrating WDD all year. There are more than 35 million people with diabetes today living in the MENA region.

According to Dr. Sania Nishtar, Chairperson for the WHO Global Commission for Noncommunicable diseases (NCDs), "Women and girls should be empowered with access to knowledge and resources to strengthen the capacity to prevent type 2 diabetes in their families and better safeguard their own health." (Diabetes Voice, Oct 2017).

IDF estimates that 1 in 10 women are living with diabetes. Diabetes is the ninth leading cause of death in women globally, causing 2.1 million deaths each year. One important group is women with gestational diabetes (GDM) as 1 in 7 births is affected by gestational diabetes which is potentially preventable. As a result of socioeconomic conditions, women and girls with diabetes experience barriers in accessing cost-effective diabetes prevention, early detection, diagnosis, treatment and care, particularly in developing countries.

Education and awareness are a significant priority of all MAs in the region and WDD plays a pivotal role in awareness campaigns, empowerment of people, and in organization of infrastructure for clinical and public health strategies.

Our region is specifically focused on women and girls emphasizing the need for improving nutrition and physical activity, as they are not only cost effective from a health system perspective, but also potentially for society as a whole. Awareness and screening campaigns were organized in all MAs including, but not limited to, Palestine, Saudi Arabia, Lebanon, Afghanistan, Yemen, Egypt, Sudan and Pakistan.

Annual diabetes walks are always large events in MENA MAs. Likewise, seminars and training workshops for healthcare professionals have been conducted especially focusing on women's health. In summary, all involved in the care for people with diabetes are proud of all the work for WDD 2017 will help transform women's health globally.

Nizar Albache is Chair for the IDF Middle East and North Africa Region

Abdul Basit is Chair-Elect for the IDF Middle East and North Africa region.

IDF South and Central America (SACA) region

Balduino Tschiedel

The IDF SACA region includes 20 countries, with Cuba to the north, Brazil to the east, Chile and Argentina to the south and Guatemala to the west. With great excitement, several activities were organized for World Diabetes Day (WDD) by SACA's Member Associations (MAs). Let's take a look at some of our activities from our MAs:

In Equator, Casa de la Diabetes held a variety of symposiums and health fairs in coordination with the IDF campaign theme "Women and Diabetes." Health professionals and students from all areas attended activities including a symposium called "Learning about Diabetes" for patients, family members and the community and a health fair on food and diabetes prevention.

Despite the political hardships Venezuela is experiencing, the Venezuelan Endocrinology Society, together with the Guerreros Azules Civil Association developed an event for 100 children with diabetes who also live with scarce economic conditions, entitled "The Path of the Warrior." There the event provided ten different stations with sports activities, each one of them establishing a parallel with type 1 diabetes.

The Uruguay Diabetes Association (ADU) organised a constitutional petition for the Ministry of Health to incorporate insulin pumps in the country's health assistance plan. In addition, they held an educational camp for children with diabetes and a scientific journey, with the theme "Women and Diabetes."

The Diabetes Care Association in Argentina (CUI.D.AR) held a two-day camp for children and adolescents with type 1 diabetes (8 to 21 years of age) while LAPDI, FAD and SAD presented an open-air meeting at a park, for the community with workshops and physical and educational activities.

The Brazilian Diabetes Society (SBD) scheduled an event at a public venue lasting the entire day on November 14th with lectures, mini shows, laboratory and ophthalmological exams, and anthropometric measurements – it is estimated 3000 people attended. In addition, sports events (a run, walk and bike ride) kept everyone fit and happy. Brazil's 11 regional branches organised lighting ceremonies at public monuments in blue and promoting local lectures.

The National Association of Diabetes Care (ANAD) held an entire week dedicated to diabetes, with educational actions, plus two thousand glycaemia, vision and foot tests free of charge. A stand for diabetic retinopathy telediagnosis was assembled at a public venue.

ADJ Brazil provided glycaemia tests and diabetes orientation meetings, in addition to participating with SBD for the walk, run, bike events. They also presented an event at the Museum of Image and Sound, with the theme "Women and Diabetes" with life stories told by patients.

The Institute for Children with Diabetes (ICD) hosted a breakfast with the press, to present data on diabetes, and its traditional Race to Beat Diabetes (its 19th anniversary), which took place Sunday November 19th. Thousands of people participated to help fight diabetes.

I believe in the importance of World Diabetes Day through all the events and activities affiliated to IDF around the world. We do this to generate global awareness about diabetes, which is sometimes so silent, but always dangerous.

Balduino Tschiedel is Regional Chair-Elect of the IDF South and Central America region.

Education and Integrated Care Stream: achieving success through integrated care

Edwin B. Fisher

The Education and Integrated Care Stream will include a wide range of topics ranging from "Low-carbohydrate diets - Is there a best diet for diabetes?" to examples of national programs addressing care and policies.

Integration of diverse sources and supports for care and management will be a major theme. A teaching lecture will include global successes in tobacco control as models for how policies, communities, health care, and resources outside the healthcare system can be brought together to achieve major changes in health problems. Continuing this theme, a symposium on community approaches will include presentations from India and Palestine as well as a presentation on the North Karelia project in Finland that showed how integrated resources across an entire region reduces cardiovascular disease. Another challenge to integration is bringing together specialty and primary care, the topic of a symposium with examples from Shanghai, Cuba and Brazil. Still emphasizing integration, a symposium on digital health and modern technologies will discuss how new technologies can bring together key supports for diabetes management, such as peers and families.

Of central and enduring importance, self-management will be the focus of several symposia addressing the role of the diabetes educator – beyond education to on-going diabetes self-management support, guidelines, barriers to and facilitators of implementing diabetes education, as well as emerging topics and conceptual and strategic issues in self-management.

Peer support has received growing recognition in recent years. A teaching lecture will discuss global evidence as well as lessons learned and opportunities for peer support. Additionally, a symposium and an open forum on peer support will include presentations from Africa, China, the Caribbean, Denmark, France and the Americas.

Mental health problems and diabetes distress – often related but not the same – will each be the topic of symposiums, including a Finish example of integration of primary care with social, educational, and vocational services.

Edwin B. Fisher

Prevention of diabetes will be the focus of a symposium with representative programs from Africa, China, and the United Arab Emirates. More regional and national examples will be the focus of an open forum including programs from Rwanda and Shanghai while another open forum will examine multi-sector national initiatives and policies in the United Arab Emirates and Northern Europe.

A highlight of the stream will be the Award Lecture by Yutaka Seino from Japan who will discuss "Exploring diversity of diabetes: Science-navigated care and education."

Rounding out Education and Integrated Care, six oral poster sessions will address similar themes, including

diet and physical activity, challenges to self-management and care; community based care; global perspectives on diet and physical activity; digital health, innovative channels, and communication; innovative educational approaches; and improving diabetes care.

Edwin B. Fisher, Ph.D is Professor in the Department of Health Behavior in the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill. He is a past-president of the Society of Behavioral Medicine and editor of Principles and Concepts of Behavioral Medicine: A Global Handbook (Springer, 2017). In addition to diabetes, he has published papers on community and peer support in health and health care, asthma, cancer, smoking cessation, weight management, concepts of psychopathology, depression, schizophrenia and on the relationships among mental illness and physical disease. From 2008 through the present, he has served as Global Director of Peers for Progress (peersforprogress.org), promoting peer support in diabetes and chronic disease prevention and care worldwide.

The Diabetic Foot Stream: the most frequently recognised complication

Lawrence Harkless

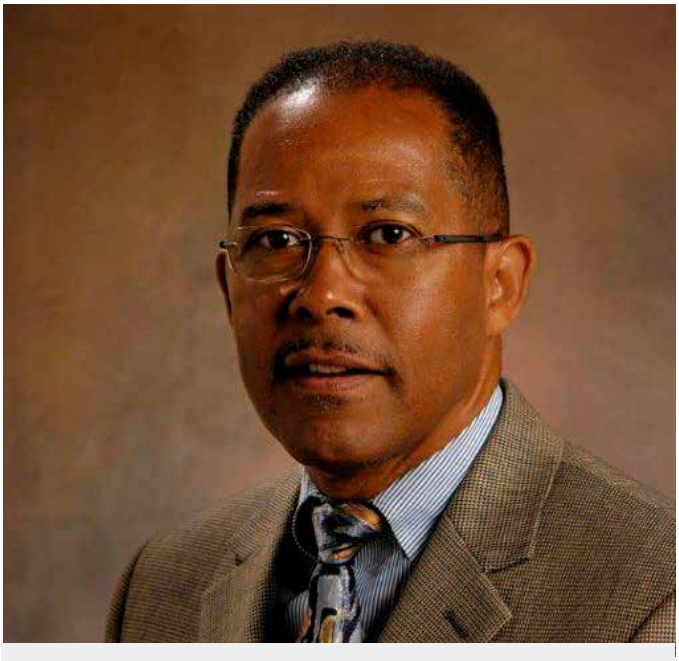
The Diabetic Foot is a major medical problem worldwide and the most pressing. Complications of diabetes that affect the lower extremities are common, complex and costly. Foot ulceration is the most frequently recognized complication. Prevalence data from IDF estimates that annually foot ulcers develop in 9.1 million to 26.1 million people with diabetes globally. The lifetime risk for developing tissue loss through a diabetic foot ulcer (DFU) is between 19% and 34% among patients with diabetes. Approximately 60% of DFU'S progress to diabetic foot infections (DFI) and 20% of those infections lead to some form of amputation. Losing a limb is among the most feared complications.

The Diabetic Foot Stream for the IDF Congress 2017 will provide sessions covering several issues including: Prevention: How to mobilize patient organizations; Organizations for educating patients; Educating healthcare providers in primary care; Footwear for people with diabetes and people with symptoms of Diabetic Foot; What next after amputation?; and Peripheral artery disease (PAD) in people with diabetes.

Two highlights will be the Meet the Experts sessions on Infection where Professor Eric Senneville will discuss osteomyelitis and Professor William Jeffcoat will discuss Understanding the Cause of Diabetic Charcot and how to make the correct diagnosis. The second highlight is the session on Footwear for people with Diabetes and people with symptoms of Diabetic foot. Sicco Bus the leading authority on offloading will discuss prevention of occurrence/reoccurrence on DFU and footwear in low income settings.

Our program will offer sessions covering educating healthcare providers in primary care. The recently published IDF clinical practice guidelines targeting primary care physicians will be presented and discussed. An Open Forum on PAD in people with diabetes with topics covering evidenced based management and the role for technology.

Cooperation and communication between the healthcare professional and the person with diabetes will be presented and discussed in the opening symposium of the Diabetic Foot stream. The closing lecture is a must attend: Tying it all together: Challenges and Improvement in Integrated Diabetic Foot Care presented by Professor Andrew Boulton (Manchester, UK) who is the leading authority on the Diabetic Foot globally.



Lawrence Harkless

Dr Lawrence Harkless is Founding Dean of the College of Podiatric Medicine and Professor of Podiatric Medicine, Surgery and Biomechanics at the Western University of Health Sciences. He has educated thousands of students, residents, physicians and healthcare providers about the complexities of diabetic foot complications and the importance of preventative foot care for people with diabetes as well as operating his own private practice.

Q&A: Key points for IDF Diabetes Atlas 2017

Meet Professor Nam Han Cho, President-Elect of the International Diabetes Federation (IDF) and the Chair of the IDF Diabetes Atlas Committee for the 8th edition, who welcomed the opportunity to answer questions about the new IDF Diabetes Atlas, and the methodology used to generate estimates.

1. If there was to be just one key message from the 2017 IDF Diabetes Atlas to communicate to the world, what would it be?

Rise in numbers related to an aging population with diabetes: 30% of people with diabetes are over the age of 65 (123 million people out of 425 million people) and the number will increase to 40% by 2045 (253 million people out of 629 million people). This is due to the improvements in the healthcare systems and increase in the healthcare expenditure when people are able to live longer with diabetes. A new section reporting on diabetes among people older than 65 years has been added to the 8th edition of the Atlas.

2. Have there been any notable changes related to regional or country data?

Diabetes affects all regions, but the regions that have vastly increasing number of diabetes cases are the Africa Region and the Middle East and North Africa (MENA) Region. The Africa Region is estimated to have the fastest growing number of people with diabetes, since it is estimated that by 2045, the number will increase 162.5% to 41 million and the number of people with impaired glucose tolerance (IGT) is expected to increase 154.3% to 102 million. Even today, over two-thirds (69.2%) of adults with diabetes are undiagnosed. The second highest increase is expected in the MENA region where by 2045 the number of people with diabetes will increase 72% to 67 million and the number of people with impaired glucose tolerance (IGT) is expected to increase 94% to 64 million.

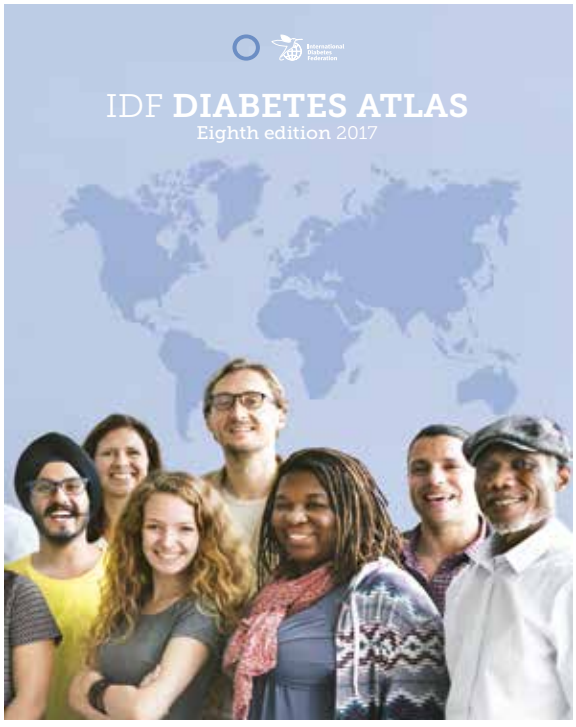
Country-wise China remains on top at the number one position with the highest number of people with diabetes worldwide; furthermore, their number has grown 5 million more from the previous Atlas edition, which is the highest growth among the top 10 countries. People with diabetes in China are also almost double compared to the second country, India, and more than triple compared to the third country, the United States. The top 10 countries have currently 60% of all people worldwide with diabetes.

Professor Nam Han Cho, President-Elect, IDF

Measured in International Dollars, India and Mexico have now made it to the top 10 countries list in diabetes-related healthcare expenditure jumping to fourth and eighth position respectively. The top 10 countries spend 75% of the global healthcare expenditure for diabetes.

3. In 2017, it is estimated that 425 million people (aged 20-79 years) are living with diabetes—what can be done to help the world understand that diabetes can no longer be ignored?

For the first time the IDF Diabetes Atlas also contains recommendations for actions that can be taken to reduce the impact of diabetes locally, regionally and globally. First, high-quality research on diabetes epidemiology has to be promoted, through strengthening surveys and regular surveillance systems. Secondly, diabetes care and control has to be prioritised, healthcare personnel trained appropriately and access to essential medicines ensured. Thirdly, National Plans and Strategies need to be implemented and governmental services scaled up to reduce diabetes burden. Fourthly, health promotion needs



to be extended to reduce diabetes and its complications.

4. What are the greatest barriers in attempts to report data for the 2017 Diabetes Atlas?

In the current Atlas, we already have 221 data sources from 131 countries, which contain more than 91% of the global population. However, there is still room for improvements in the methodology, such as taking into consideration more variables including socio-economic measures, indirect costs of diabetes, fasting plasma glucose (FPG) or type 2 diabetes among children and adolescents. Existing methodology and its sensitivity analysis could also contain more risk factors in the model, such as obesity or age distribution in each country.

We are also missing national data from many low-income countries, especially in Africa, where we don't have data sources for two thirds of the countries. We need new scientific reports from those countries that are lacking their own data, because now we have to extrapolate estimates from the neighbouring countries.

As a conclusion however, scientists around the world think that the approach the IDF Diabetes Atlas uses is the right way to manage insufficient data and believe it is close to the reality.

5. Why did the Atlas Committee decide to dedicate one full chapter to the complications of diabetes?

Acute and chronic diabetes complications have not received attention in the IDF Diabetes Atlas before, despite being the main reasons for early mortality, and very prevalent among people with diabetes. This is one way of telling the audience about the often ignored consequences and revealing the tragic burden of diabetes. Making the connection between complications and diabetes requires training and experience to be included to management care plans. The earlier diabetes complications are diagnosed, the easier it is to stop them from progressing. The complications can also easily be prevented, when people with diabetes are educated about adapting to a healthy lifestyle.

6. What are the IDF key initiatives for 2018-2020 that will address the critical issues above?

As the global voice of people with diabetes, there is much that IDF can do to promote knowledge exchange and understanding of recent scientific advances and to help drive policy change to ensure that new solutions relating to the detection and treatment of diabetes are available, accessible and affordable to all. In 2018 and 2019, the core initiatives and programs build on five focus areas, which are (1) Humanitarian programs, (2) Diabetes Care, Access and Prevention; (3) Education; (4) Epidemiology; and (5) Advocacy and outreach.

Examples of these are:

1. The IDF Life for A Child Programme supplies essential diabetes care to 18,000 children living with diabetes in 42 countries.

2. The IDF Eye Health strategy will ensure that the impact of vision loss due to diabetic retinopathy (DR) and related complications are reduced.

3. The IDF School of Diabetes brings healthcare professionals a one-stop portal giving access to the best in-class diabetes education.

4. Taking Diabetes to Heart, which is a global CVD survey, focuses on CVD awareness and knowledge among people living with type 2 diabetes.

5. The Young Leaders in Diabetes (YLD) or the Blue Circle Voices (BCV), represent the interests of people living with, or affected by, Type 1 or Type 2 diabetes as strong advocacy groups.

Professor Nam Han Cho is President-Elect of the International Diabetes Federation for 2016-2017. He is also the chair of the IDF Diabetes Atlas Committee.

The Time Bomb of IGT

Suvi Karuranga and Anne Wiebke Ohlrogge

Let's talk numbers: the 8th edition of the Diabetes Atlas 2017 reports that over 350 million people between 20 to 79 years worldwide are estimated to have developed impaired glucose tolerance (IGT). Translated, this estimate equates to more than every 14th person worldwide with impaired glucose regulation after testing for an oral glucose tolerance test (OGTT), routinely used for diagnosing type 2 diabetes. IGT occurs when results are above the normal range (7.8 mmol/L (140.4 mg/dL) to 11.1 mmol/L (199.8 mg/dL)), but not high enough to be classified as having diabetes. IGT, also called prediabetes, carries a high risk for developing type 2 diabetes. Prediabetes is a term that covers varying degrees of altered glucose metabolism.

IGT is a time-bomb and it requires action. By 2045, it is projected that 587 million people will be diagnosed with IGT or every 12th person between 20 and 79 years will have IGT. In general, women and men are equally affected, but differences do exist by lifespan. While the prevalence of IGT in younger age (<45 years) is slightly higher in women, the prevalence in older age (>50 years) is higher in men. Notable is that almost half of all adults with IGT are under the age of 50 years, and nearly one-third of them are between 20 to 39 years. If the condition is left untreated, people are not only at high risk of developing type 2 diabetes, but because of development of IGT at a young age, people in this category are very likely to spend many years at a higher risk for type 2 diabetes.

The majority of people with IGT live in low- and middle-income countries (72.3%). However, the IDF North America and Caribbean region has the highest prevalence of IGT (14.1%) among all IDF regions, equalling to every seventh person. South East Asia has the lowest prevalence for IGT (3.5%). Noteworthy is that the three countries with the highest prediabetes prevalence are China (48.6 million), United States (36.8 million) and Indonesia (27.7 million), and in total make up nearly one-third of the worldwide IGT prevalence. Despite these alarming figures, National Diabetes Prevention plans still don't exist in many countries.

These numbers are alarmingly high and reflect a large distinct global population at risk for type 2 diabetes. Currently, IGT does not get much attention from healthcare providers, because many people experience no symptoms at first.[1] People who have developed prediabetes are likely to stay undiagnosed and under the surface until the condition develops into type 2 diabetes. Nonetheless, IGT does not only increase the risk for developing diabetes, but it also increases the risk of experiencing Cardiovascular Diseases (CVDs) and other major health complications for eyes, kidneys or the nervous system.[2] In earlier research, it was estimated that up to 70% of people with IGT develop type 2 diabetes.[2]

Ignoring IGT may have a primary role in early mortality. Worldwide, over 4 million people (20-79 years) are dying because of diabetes. This number is higher than the combined number of deaths from infectious diseases (HIV/AIDS: 1.1 million[3]. Tuberculosis: 1.8 million[4], Malaria: 0.4 million[3]). In the IDF South-East Asia region over 0.58 million people die due to diabetes before the age of 60 years. In the Africa Region, approximately 77% of all deaths that happen before the age of 60 years are attributable to diabetes.

Prediabetes also has a significant economic role in terms of lost productivity and increased health systems cost. People with IGT are more susceptible to overuse healthcare services and are thus subject to higher healthcare expenditure. In the US, for example, it was estimated that USD 44 billion was spent on healthcare only due to IGT.[5]

While IGT and other forms of impaired glucose tolerance put individuals at high risk for developing type 2 diabetes, in many cases these conditions are preventable and reversible. Meda Pavkov, a physician scientist from the Centers for Disease Control (CDC), weighs in on what is commonly known, but seldom acted upon. "Impaired Glucose Tolerance is a serious but preventable and reversible health condition. Both persons who are affected and their physicians need to recognise this condition and

take action. Losing weight, a healthy lifestyle and getting regular physical activity can prevent its progression to type 2 diabetes as well as reverse it back to a normal state."

The risk factors of prediabetes are the same as for type 2 diabetes: overweight, poor diet or poor nutrition, lack of physical activity, smoking, advanced age, and family history.[6,7] There are a number of high quality studies which support the effectiveness of lifestyle interventions and changes in behaviour to preventing the progression of prediabetes to type 2 diabetes.[8-10] Lifestyle modifications include diet, more physical activity, or weight loss. Studies suggest that even a moderate reduction in weight and only half an hour of walking each day reduces the incidence of type 2 diabetes by more than one-half.

So, what should we do? The problem of IGT must be acknowledged, because we have measures to turn the trend around! As simple as it sounds, a healthy (ier) diet and more physical activity (e.g. walk/bike to work) can do the trick.

Key points from the IDF Diabetes Atlas 2017 related to IGT and their interpretations:

ATLAS KEY MESSAGES	WHAT DO THEY REALLY MEAN?
GLOBAL PREVALENCE OF IGT IS 7.3% IN 2017	IGT is known to be interlinked with other chronic conditions, obesity and diabetes complications causing serious public health threat to our generation. Especially some parts of the world carry higher burden on this condition, such as the North America and Caribbean region, which has the highest prevalence of IGT (14.1%). Furthermore, China has 60 million people with IGT, which is 17% of the global total.
THE NUMBER OF PEOPLE WITH IGT IS 352.1 MILLION	People with IGT are often unaware of their condition and therefore do not know it is important to take care of their health. One to three out of every four people with IGT will develop diabetes within a decade. It is important to note that nearly one-third (28.8%) of all those who currently have IGT are in the 20-39 age group and are therefore likely to spend many years at high risk and often not knowing.
34 MILLION MORE PEOPLE WITH IGT SINCE 7TH EDITION. BY 2045, THE NUMBER OF PEOPLE 20-79 YEARS WITH IGT IS PROJECTED TO INCREASE TO 532 MILLION	IDF draws its estimates on reliable data sources and can observe a rising trend, but IGT is also preventable and reversible and these huge prevalence figures can be avoided. Prevention through healthy lifestyle such as physical activity and healthy diet will help prevent IGT. Government investments are needed to provide health education and healthy environments to live.

Managing my risk for type 2 diabetes

Sila Thmor Chy, 42 years, Cambodia.

Four years ago, my doctor concluded that I had prediabetes, after following my blood glucose levels for some time, which were around 102-105 mg/dL (5.6-5.8 mmol/L). The highest blood-glucose level was about 112 mg/dL (6.2 mmol/L). My doctor recommended that I try to work on exercising more, eating less simple carbohydrates (such as rice, breads and sweets) and changing my sleeping behaviour. I took my doctor's advice.

For the past four years, I am managing my condition through a healthier lifestyle without any medication. I ride 30 km by bike every morning and I eat a healthy diet. Moreover, I further enhanced my lifestyle by changing from staying up late at night, to going to bed earlier, having enough sleep and waking up early.

I check my blood glucose levels regularly to monitor my condition and to avoid any complications. With these changes, I lost 12 kilograms and maintain a stable body weight. I continue to manage my prediabetes.

Suvi Karuranga is the Epidemiology Manager at the International Diabetes Federation. She has five years international experience in global health research, access to medicines and programme development. She holds a master's degree in public health from the Lund University and has a clinical background as a public health nurse in Europe and Africa.

Anne Wiebke Ohlrogge (MSc) is currently an intern at the Policy and Programmes department of the International Diabetes Federation global office. She has a Bachelor and a Master Degree of Science in European Public Health (Governance & Leadership) from Maastricht University.

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An inexplicable upsurge: the rise in type 1 diabetes

Elizabeth B. Snouffer

When I was diagnosed with type 1 diabetes, I wasn't told what specifically triggered the destruction of my insulin-producing pancreatic β-cells but I was told genetics played a role, that diabetes was a serious condition and I would be dependent upon exogenous insulin and a strict dietary regime for life. As I navigated through school and community (Baltimore, Maryland (USA)), I carried juice boxes, syringes, and a vial of insulin in my backpack. I was open about my condition in part because I wanted to meet another student with type 1 diabetes, just like me. For many years, I never met another young person living with type 1 diabetes until I was introduced to another high school senior at a different school. We commiserated about our longing for ice-cream and the delight in managing hypoglycaemic episodes with all our favorite but forbidden foods. Sadly, he did not live to see his 20th birthday due to complications of diabetes, but I thought about him this October as I celebrate 40 years with type 1 diabetes. I've come a long way and yet, we still do not know what triggers β-cell autoimmunity and further, why so many more children and young adults are developing autoimmune diabetes.

Dr. Marian Rewers, Head of the Colorado Center of "The Environmental Determinants of Diabetes in the Young" (TEDDY) study does admit there was little awareness for the rise in type 1 diabetes at first, but says documents providing evidence were from the early 1980s: "The first registry-based observation of the epidemic in 1982-84 was published in Diabetes in 1987, followed by an international study confirming the epidemic in most of the 10 countries that had a registry in 1990. Looking back, the incidence probably started to rise already in the 1950's but there was no reliable data until the late 1960's."

The fact is that the incidence of type 1 diabetes has risen considerably in the past 30 years[1], and while many experts might argue different cases for possible identifiable triggers – one thing is certain, the jury is still out and a great deal of research is still needed.

An inexplicable upsurge

According to the 8th Edition of the IDF Diabetes Atlas, the number of young people <20 years living with type 1 diabetes worldwide is estimated to be 1,106,500 million[2] which is double the number cited in the previous Diabetes Atlas[3] due to the expansion of the age group by five years. This may raise other questions but one thing is clear, the incidence and prevalence of type 1 diabetes are both growing with great variation worldwide.[4]

IDF's Europe and North America and Caribbean regions, have the largest number of children with type 1 diabetes (Table).[2] The US has the largest incidence and prevalence of children with type 1 diabetes in age groups under 15 and 20 years.[2] However, type 1 diabetes is most common in Finland (>60 cases per 100,000) and Sardinia (around 40 cases per 100, 000).[5] Additionally, Europe has seen increases in children younger than 5 years of age,[6] and annual increase rates have been reported in Norway, Germany, and in Finland.[7]

In the US, the SEARCH for Diabetes in Youth Study reported the prevalence of type 1 diabetes in children and young adults ages <20 years rose by 21 percent between 2001 and 2009 and showed a significant impact on minority populations—unusual as these populations had previously low rates of the disease.[8] More recent data from a new US study (in collaboration with the SEARCH for Diabetes in Youth study) strengthens this position: non-Hispanic white youths had the smallest annual increase in type 1 diabetes diagnoses while Hispanic youths had the highest annual increase in incidence (4.2%).[9] Overall the US study reported the annual increase for the 10-year period was nearly two percent for type 1 diabetes diagnoses and nearly five percent for type 2 diabetes.[9] While it's no surprise that type 2 diabetes in youth, particularly in the US, has developed in tandem with rising rates of obesity, type 1 diabetes has a much less identifiable explanation.

Professor Elizabeth Mayer-Davis, PhD, Professor of Nutrition and Medicine, and Chair of the Department of

Nutrition, at the University of North Carolina at Chapel Hill, primarily focuses on type 1 diabetes in youth and young adults, and has concerns about the rate seen in Hispanic children in the US. "It could be that Hispanic population genetics are different in such a way that environmental triggers for autoimmunity and disease progression are affecting them. What we do know is that here is a subgroup in the US with a higher rate of change and we need to figure out what the exposures are for these children."

Moving away from the high rates of type 1 diabetes in North America and Europe, it is of particular interest to assess countries where type 1 diabetes was nearly unheard of or rare in the past, but where there now exists a range of global variation in incidence that reflects a somewhat random pattern.

• In a 30-year study in a Brazilian municipality (Bauro, Brasil) the annual incidence of type 1 diabetes increased 4% in children ages ≤14 years.[10] Brasil has the third largest incidence and prevalence of children with type 1 diabetes worldwide.[2]

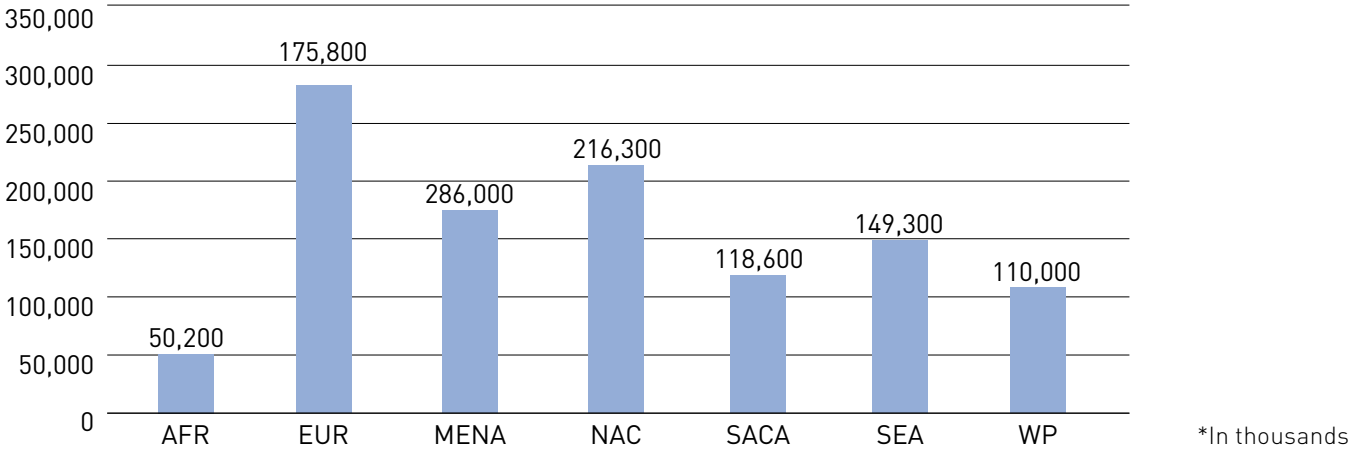
• While incidence of type 1 diabetes in China has to a large degree been unclear, a 2016 systematic review and meta-analysis confirmed increasing incidence of type 1 diabetes over time in mainland China: from 0.57 (0.43–0.75) in 1990 to 1.04 (0.64–1.68) in 2000 and 3.36 (1.66–6.82) in 2010. ($p<0{\cdot}0001$).[11]

• Researchers studied the incidence of type 1 diabetes in Kuwaiti children 0-14 years during 2011 to 2013 and compared results with data collected during 1992 to 1997. The incidence of type 1 diabetes in Kuwaiti children 0-14 years has doubled in the last 2 decades.[12]

• Type 1 diabetes is the second most common chronic disease in children in India,[13] and the IDF Atlas estimates that India has the second largest incidence and prevalence of children with type 1 diabetes worldwide.[2]

• In Saudi Arabia, studies indicate a significant increase in incidence rates of type 1 diabetes in groups older than 12 years.[14] Saudi Arabia is eighth on a list of top 10 countries for number of children diagnosed per year, just after the United Kingdom.[2]

Experts believe if the current rates continue to increase, the global incidence of the number of children and youths developing type 1 diabetes could double in a matter of years.



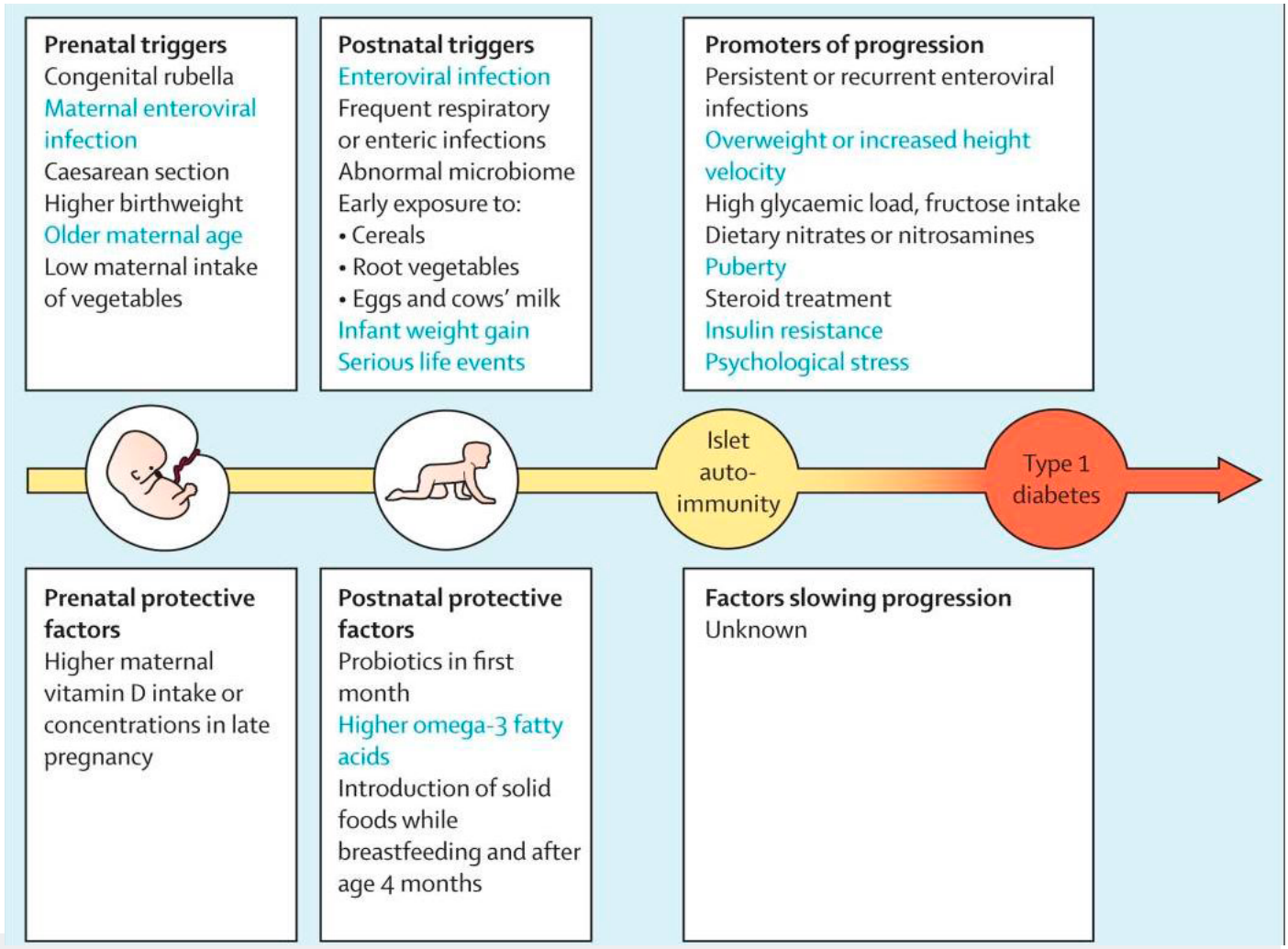
Estimated number of children and adolescents (<20 years) with type 1 diabetes by IDF region, 2017. Source: IDF Diabetes Atlas 8th Edition 2017

Factors for progression

For many decades, there has been a long list of possible factors that may drive progression from autoimmunity to overt type 1 diabetes in genetically predisposed individuals. Though genetic markers identify risk, islet autoimmunity can only begin once multiple islet autoantibodies are present. Individuals who express two or more positive autoantibodies are likely to develop type 1 diabetes.

However, the time to diabetes diagnosis varies tremendously, and the factors influencing progression are not understood. Most experts agree that a trigger from the environment is needed for the development of a type 1 diabetes diagnosis.[1] Environmental triggers include infections, diet, and toxins that could have an effect on children in all phases of early development (Figure). Some of the most promising candidate environmental factors for type 1 diabetes include[1]:

- Respiratory infections;[15]
- Infant formulas;[16]
- Intestinal microbiota (associated with C-section deliveries, use of antibiotics; early childhood nutrition);[1]
- The hygiene hypothesis variant (decreased herd immunity to enteroviruses).[1]



Environmental triggers and protective factors for islet autoimmunity and promoters of progression to type 1 diabetes for which an association has been suggested. Triggers and factors with the strongest evidence base are shown in blue. (Rewers M, Ludvigsson J. Environmental risk factors for type 1 diabetes *Lancet* 2016;387: 2263-2350.)

Additionally, the accelerator and β-cell stress hypotheses proposes how several environmental factors could be at play in a child's risk development including: overweight, fast growth, a range of dietary deficiencies, trauma, psychological stress—alone or combined could drive pancreatic β-cell exhaustion, resulting in islet failure and type 1 diabetes.[1] Many factors thought once to be strong triggers for type 1 diabetes are no longer seen as candidates: vaccines and cow's milk.[1]

Professor Johnny Ludvigsson and Dr. Marian Rewers authors of the 2016 publication Environmental risk factors for type 1 diabetes (*Lancet*) both believe that research currently has not established what trigger could be identified as the most likely, "we just don't know." However, key for further study (Figure) would be "infant diet, patterns of infections and environmental pollutants." says Professor Ludvigsson, while Dr. Rewers adds that "studying infections in mothers during pregnancy" may be very significant. As for why type 1 diabetes is appearing in places like Asia, where it was once rarely seen, Dr. Rewers believes "high incidence in parts of Asia, especially the Middle East, suggests changes not only in diagnosis (versus those undiagnosed and early death) but also an increase of incidence due to changes in lifestyle," he says.

The current type 1 diabetes population is characterized by diversity: stark differences in age, race, genetic identity and phenotype. If anything, environmental exposures leading to type 1 diabetes vary greatly which explains the current inconsistencies worldwide. More tests are needed to study genetic background and environmental exposures. Research must continue to define the environmental causes of type 1 diabetes—in part by studying different populations—to broaden our understanding and prevent or delay the current and continued rise in type 1 diabetes.

Elizabeth B. Snouffer is Editor of Diabetes Voice

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Urbanisation and Diabetes: Reports from India and Bolivia

According to the *8th edition of the IDF Diabetes Atlas (2017)*, there are more people (20-79) years with diabetes in urban (279.2 million) versus rural (145.7 million) settings, and the prevalence is higher in urban versus rural (10.2% vs 6.9%) environments. The number of people living with diabetes in urban areas is expected to increase to 628.6 million in 2045 due mainly to global urbanization. While there are many factors that are contributing to the global diabetes epidemic, the combination of overweight and obesity, poor lifestyle behaviors and limited opportunity for improving health status are defining characteristics of urbanisation; these factors are also intertwined with an increased risk for type 2 diabetes.

In this special report, Vijay Viswanathan and Douglas Villarroel, both experts in the field of endocrinology and diabetes, discuss urbanisation and specific challenges related to diabetes in their home countries of India and Bolivia respectively.

The impact of rural-to-urban migration upon diabetes in Bolivia

Douglas Villarroel

The United Nations reported that half of the world populations live in cities and expected that this will rise to 60% by 2030. In Bolivia, in 1992, 58% of the national population lived in urban areas. Today, that figure is 75%.

The mathematical projection with adjustments, indicates that in 2032, 90% of the Bolivian 15 million, will live in cities. This is principally due to rural to urban migration.

The consequences of this migration in developing countries where urban planning and development is prioritized result in the rural underprivileged and the urban gifted access to better facilities and economic opportunities in urban centers than rural areas.

From the 339 Bolivian municipalities, 256 have a population of less than 20,000 inhabitants and in none of

them is there a second level hospital, nor will there be any for reasons of economy of scale.

A peasant who moves to live in a city ceases to be a peasant because his productive, social and cultural relationship is with the land factor. An indigenous native who moves to live in a city, does not cease to be one, but does not take with him his mode of production; in the city there is no hunting, fishing or gathering, and both must compete at a disadvantage because they do not possess the instruments required by urban life.

Migrants in general tend to suffer from worse health and display disadvantaged risk factor profiles. While the trends of increased risk of diabetes among migrants are well documented, much less is known about the effects of rural-to-urban migration in Bolivia.

There is an important impact of the rural-to-urban transition upon diabetes in Bolivia. Being exposed to unhealthy lifestyles in an urban environment will increase the risk for developing diabetes. Migrants acquire the high risk of the urban population because their traditional ways of living are lost. They adopt modes of life that put them at similar risk to the urban population.

In Bolivia, a high percentage of the population declares themselves as indigenous (62%), presenting large disparities in health indicators that could be attributed to living in rural areas with a lack of healthcare. Despite there being minimal data on the prevalence of diabetes in the indigenous population of Bolivia, there are barriers to healthcare such as cost, education and also mistrust in healthcare services.

The migration from rural to urban areas is due largely for economic reasons. But, theres is another reason that may not be so obvious: climate change.

Santa Cruz de la Sierra, situated in eastern Bolivia, is one of the fastest-growing cities in the world: in the year 1900 the city had 18,335 inhabitants, by 1960 the population rose to 70,000. In 1976, the population skyrocketed to 254,682 inhabitants and in 2012, the population of Santa Cruz de la Sierra was nearly two million. It is expected that by 2020 there will be four million.

Santa Cruz will be, by far, the most populated city in Bolivia not only because of the historical tendency of growth, but also due to other events in the rest of the country related to climate change, such as desertification (process of ecological degradation of fertile land) of the Altiplano (Andean Plateau) and the Chaco zone (southwestern semi-arid lowland); the salinization (accumulation of salts) in other rural areas or the floods in Pando (northwestern jungle) and Beni (northeastern lowlands). People are moving, because of climate change, from one part of the country with less prevalence in diabetes to another with a higher prevalence.

Therefore regardless of the location, action needs to be taken to improve the health status of the population. Potentially, as the country's economy grows, the disparity between rural and urban centres will be reduced. Therefore interventions specifically promoting healthy lifestyles will need to be undertaken to reduce the effect of the westernised lifestyles that have been imposed as desirable in Bolivia.

Douglas Villarroel is an endocrinologist, educator and Bolivian author. Currently, Dr. Villarroel is Editor-in-Chief of Diabetes Voice.

Urban diabetes in India

Vijay Viswanathan

It is estimated that the overall prevalence of diabetes in India is about 7.3 % if both the urban and rural population is taken into consideration.[1] In addition, according to the newly released IDF Diabetes Atlas, 8th edition (2017), the national prevalence for diabetes (20-79 years) in India is estimated to be 8.8%. One consideration is certain: the prevalence of diabetes in urban India seems to be higher among those states which are economically stronger.[1] An important observation seems to be the fact that in some of the economically well-to-do states, the prevalence of diabetes among the urban poor appears to be going up.[1]

This fact probably reflects the higher genetic susceptibility of Asian Indians to diabetes. Since the urban poor also have this higher genetic susceptibility, they seem to develop diabetes when the environmental factors become favourable. These factors include weight gain with increased food intake and reduced physical activity when those who are economically below the margins get a two wheeler like a motorcycle or scooter to ride to work.

However, the fact remains that the urban poor have a meagre income to take care of their daily needs and have difficulty to pay for diabetes care. Though the government hospitals do provide minimal care for diabetes, it becomes difficult for some people to access free or subsidised diabetes care. Another important factor that needs to be investigated is whether the urban poor have a higher prevalence of diabetes due to air pollution. There have been studies which have shown an association between air pollution and type 2 diabetes.[2]

The risk factors for diabetes among the urban poor seem to be significant in studies from India.[3,4] The prevalence of obesity was 57.3% in a study conducted from South India and the reason seems to be related to unhealthy diet and physical inactivity. The diet pattern among the urban poor also seems to be quite contrary to the healthy diet advised for all. The high carbohydrate intake, with less fruits and vegetables which are expensive, seem to contribute to the higher obesity rates among them.[3]

It is also important to note that the cost of diabetes care in India has been reported to be high.[5] A Study from South India looking at the socioeconomics of diabetes showed that most of the patients (60%) spent money from

personal savings account for their diabetes care. None of the patients from the low- and middle-income group had insurance while only 2% of the high income group were dependent on insurance. Most of the low-income group borrowed money or mortgaged their properties to meet their expenses, which again is a reminder to the policy makers to correct the discrepancies and thereby prioritize and frame policies for the economics of diabetes care.

An increase in the prevalence of diabetes among the urban poor would increase the burden of diabetes in a developing country like India. Therefore it is imperative for health authorities and relevant stake holders to take stock of the situation and take preventive steps in reducing the risk factors for noncommunicable diseases among the urban poor. This would include promoting a healthy diet by including fruits and vegetables and reducing the intake of carbohydrates. Some of the more healthier carbohydrates like millets, easily grown nutrient rich cereals with a low glycemic index, could be advocated as a staple for people who have risk factors for diabetes like obesity and for those who have already developed the condition.[6]

Efforts could be taken with the help of public–private partnership opportunities to provide greener spaces for people to take a walk as part of their physical exercise—such spaces are lacking in most of the urban areas in India. The air pollution which is quite high in urban cities has to be reduced in developing countries by appropriate legislation, in order to reduce the burden of respiratory disorders and also noncommunicable diseases.[7] A multi-pronged approach is required for improving the dietary habits and physical activity of the urban poor and by reducing the air pollution in our cities. Efforts for improving the environment and access to healthy food will go a long way in reducing the burden of diabetes among this population in urgent need of help.

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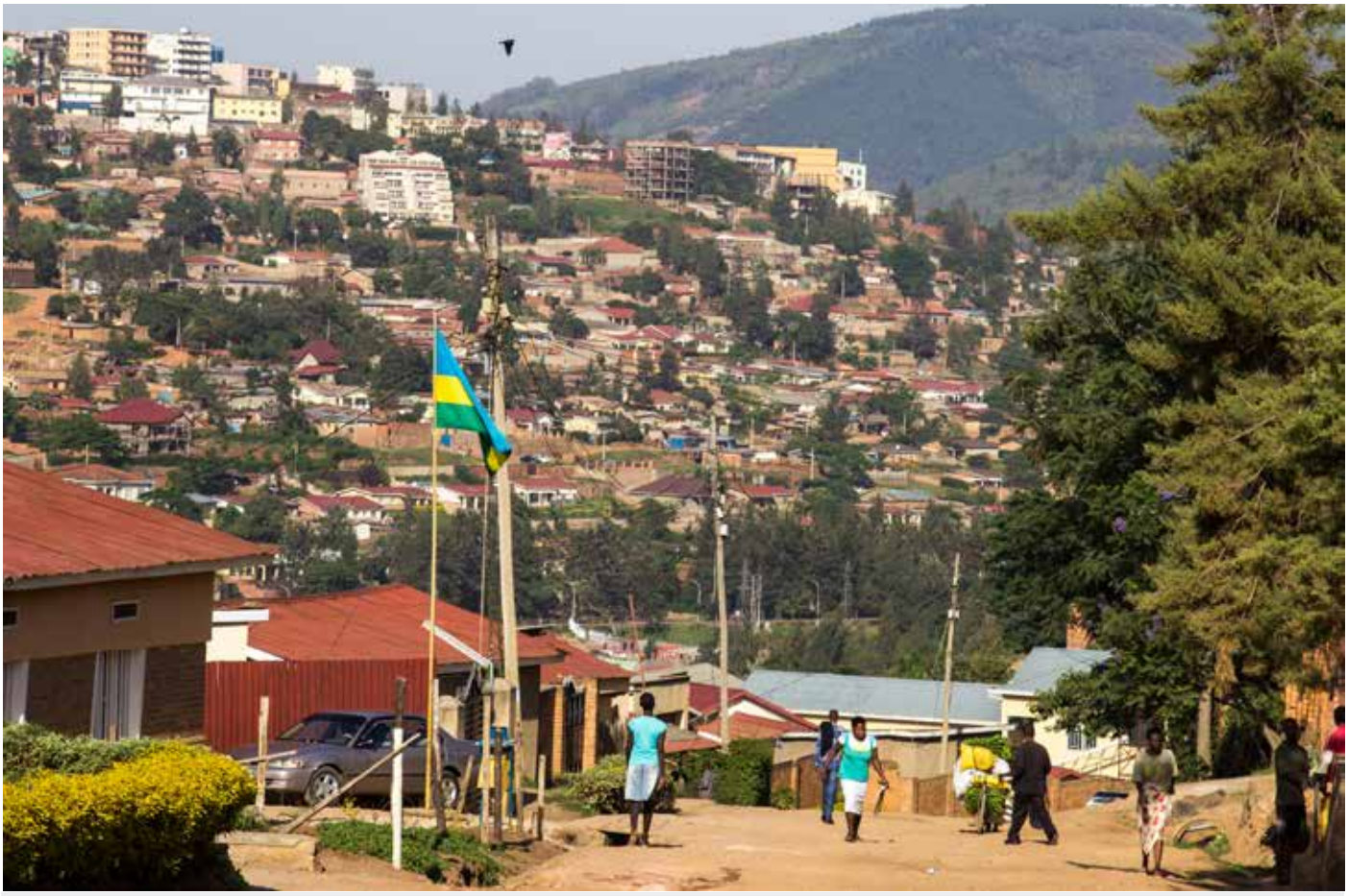
Africa Report

Living with diabetes in Rwanda

Brittany Fried



Kigali, the capital city of Rwanda.

As a young woman living with type 1 diabetes, I have never been one to sit at home and let the world pass me by. Therefore, when the opportunity to study post-genocide reconstruction in Rwanda arose, I decided I wouldn't miss it for the world. Raised in Hong Kong, Singapore, and the US, I have experienced diabetes care under three different medical systems. Everywhere I reside or travel, I aspire to learn how people live with diabetes. Upon arrival in Rwanda's capital, Kigali, I wanted to better understand the level of access to medicine and services, self-management techniques, and the perception of future prospects from those living with the condition.

With the help of the Rwanda Diabetes Association (RDA), Marjorie's Fund, and Dr. Etienne Amendezo, I was able to meet individuals living with diabetes in Kigali. Salama Umutoni, a 22-year-old female student at the University of Rwanda, was diagnosed with type 1 at age 13. Abdallah Murenzi is a businessman in his mid-30s who lives with type 2 diabetes, and Mariam Uwase, a 35-year-old nurse and mother of three, was diagnosed with gestational diabetes mellitus (GDM) during her second pregnancy. Together, these three individuals painted a picture of what life with diabetes in Kigali looks like.

Salama

Salama was diagnosed with type 1 diabetes at age 13. With the help of the RDA, she closely manages her diabetes. © B. Fried).

Salama's last HbA_{1c} was 6.4%. She attributes her tight management to mentorship she has received from the RDA. However, living with diabetes has had its ups and downs. Salama admits, "It's thanks to the RDA that I am taking insulin." Upon diagnosis, her community pushed her to pursue traditional forms of treatment, as they were afraid of insulin's long-term side effects. The RDA taught Salama that insulin is key to being healthy with type 1 diabetes; she asked RDA staff to intervene on her behalf to help her parents understand the importance of the medication. Now, she uses short-acting insulin and insulin glargine (long-acting), and injects two times per day. She also exercises often, and firmly believes that "what others can eat, I can eat."

Abdallah

Abdallah was diagnosed in 2009. His father also has type 2 diabetes and Abdallah credits his family for their assistance. "My transition into life with diabetes was strongly supported by my family," he says. For five years Abdallah had no diabetic complications, but in 2014 he began losing sensation in his fingers. Furthermore, 2016 was a trying year; due to work stress and other factors, his blood sugar averaged 200 – 300 mg/dL (11.1 – 16.7 mmol/L). Abdallah's doctor stepped in during 2017 and prescribed insulin glargine to complement his oral medication, vildagliptin. This year, his blood glucose is consistently between 100 and 120 mg/dL (5.6 – 6.7 mmol/L). Abdallah has yet to regain sensitivity in his hands but he is carefully monitoring his diabetes and exercising frequently to ensure other complications are avoided.

Mariam

Mariam was initially diagnosed with GDM in the 26th week of pregnancy with her second child. She managed her GDM with diet changes. It wasn't until 2016 when she was pregnant with her third child that she was required to take insulin. Mariam was forced into an early delivery during her third pregnancy, as the fetus was not developing properly due to GDM-related complications. After her third child was born she was told that her diabetes would be gone, too. This turned out not to be the case, as she has subsequently developed type 2 diabetes. Now, she takes both gliclazide and vildagliptin on a daily basis and checks her blood sugar regularly. When asked about challenges, she acknowledges how, "diet changes are the hardest part of living with diabetes." Thankfully, her children remain healthy.

Diagnosis

Salama, Abdallah, and Mariam all have different diagnosis stories; however, certain aspects are similar. First, each described traditional pre-diagnosis symptoms of frequent urination, dehydration, and weakness. Second, all said that doctors correctly recognized their symptoms quickly and seamlessly. Third, they were all prescribed significant diet changes immediately upon diagnosis.

Unfortunately, many in Rwanda do not have as rapid of diagnoses. Regularly, symptoms of diabetes are confused with those of malaria, especially in youth. Moreover, the diagnosis process is oftentimes delayed due to symptoms being overlooked or families visiting traditional healers

Part of the new Diabetes Centre being built by the RDA. (© Credit, B. Fried).

Brittany Fried and her host family in Kigali, Rwanda.

before health clinics.

Access to Medicine and Care

All three individuals agreed on one thing: diabetes supplies and medications are easy to come by in Kigali. Pharmacies – which are readily available throughout the city – carry test strips and needles. The numerous hospitals provide insulin and every hospital is outfitted with blood glucose meters so they can check those they believe are at risk of or have diabetes. In this case, Mariam, Abdallah, and Salama each have their own blood glucose meter.

Rwanda's universal health insurance system covers an estimated 75% of the population. Through this program, Mariam pays 10% of her health bills, which amount to RWF 10,000 (approx. USD $12) per month post-pregnancy. While pregnant, she was responsible for 10% of her insulin cost. Abdallah pays around RWF 12,000 (approx. US $14) per month for his treatment, as 85% of the cost is covered by insurance. All of Salama's medical supplies are provided by the RDA, and will continue to be until she reaches age 25. At that point, 90% of her insulin costs will be paid by insurance, but strips and other supplies will not be covered. Even under the protection of insurance, it is expensive to purchase all the necessary supplies; but without it, the cost of diabetes care would be completely unmanageable.

Salama took time to point out that while this is the case in Kigali, it is not necessarily so outside the city. She said: "in villages, many need amputations or go blind due to diabetes complications." Hospitals are much harder to access, making it difficult to purchase insulin or other supplies. Many people in rural areas cannot afford blood glucose meters so they must go to hospitals to check, meaning their blood sugar levels are rarely known. For those without access to care, diabetes remains a silent killer.

The Future

The positive attitude of all three individuals is astounding. Abdallah said that although he fears further complications, his work has yet to be impacted by his diabetes. Salama aspires to be a big business owner who "doesn't want to be affected in any way" by her type 1 diabetes. Mariam assists her doctor in his research so that she, too, may help raise awareness about diabetes.

Abdallah summed up living with diabetes in Kigali quite well when he said: "I want to encourage anyone with diabetes. You can live with diabetes, since you can manage it." This is especially true with government insurance bolstering quality medicine and care, increased awareness around the city, and resources like the RDA providing impactful mentorship for those they can reach. Nevertheless, much remains to be done outside of the city in terms of access and education for all forms of diabetes.

Brittany Fried was diagnosed at age 11 with type 1 diabetes. Now 20 years old, she is a third-year student at Georgetown University, and greatly thanks her family and community for their support in her life with diabetes.

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