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How Health Systems World-wide Fail Type 2 Diabetics

And what the ADB can do about that

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One of 5 New Papers on T2DM and Health Systems

- 1. How Health Systems World-wide Fail Type 2 Diabetics https://doi.org/10.1080/23288604.2024.2437898
- 2. Editorial: Can a 19th Century French Medical Debate Provide Guidance on How to Tackle Type 2 Diabetes? https://doi.org/10.1080/23288604.2025.2464977
- 3. Disoriented Health Systems: Development Assistance and the Challenge of NCDs through the Lens of Type 2 Diabetes With Bill Savedoff, David Peters, and Son Nam Nguyen
- 4. Correcting Market and Collective Failures in Tackling the Global Growth of Type 2 Diabetes: Application of WHO's Common Goods for Health Approach With Agnes Soucat and Sylvestre Gaudin
- 5. Can Technology Change the Trajectory for Type 2 Diabetes?

Presentation Outline

- A Sad Story of Long-Term Failure (50 years of failure)
 - Failure in every region and most countries
 - From adult-onset to younger patients
 - Eating up health system resources
- Pathophysiology of Type 2 Diabetes
- The 3 Big Health System Failures
 - Failure in early identification of hyper-insulinemia risk factors
 - Failure in clear communication of drivers and behaviors that matter
 - Subsidizing the disease
- Health System Answers

US Data from the CDC



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WHO: This is a Disaster

- <u>A quadrupling of the number in 34 years</u>. The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014
- Prevalence has been rising more rapidly in <u>low- and middle-income</u> countries than in high-income countries
- Diabetes is a major cause of <u>blindness</u>, <u>kidney failure</u>, <u>heart attacks</u>, <u>stroke</u> and <u>lower limb amputation</u>
- Between 2000 and 2016, there was a 5% increase in premature mortality from diabetes
- In 2019, diabetes was the ninth leading cause of death with an estimated 1.5 million deaths directly caused by diabetes.

DEATH AND PROLONGED SUFFERING

Bad and Getting Worse Everywhere

Adults 20-79 Years Living with Diabetes (in millions)

	2021	2030	2045	Growth Rate
North America and Caribbean	51	57	63	24%
Europe	61	67	69	13%
Western Pacific	206	238	260	27%
South and Central America	32	40	49	50 %
Africa	24	33	55	134%
Middle East and North Africa	73	95	136	87 %
South-East Asia	90	113	152	68%
World	537	643	783	46%

Source: IDF Diabetes Atlas, 10th Edition

Adult on-set No More



Bad Outcomes Meet More Spending

- In the United States alone, the total health spending on T2DM medicines, monitoring, and other treatments and commodities amounted to US\$350 billion in 2020, which is about 10 percent of everything the country spends on health
- WHO estimated that **15 percent of health budgets worldwide** were accounted for by diabetes-related illnesses

Pathophysiology



Based on: Fung, J. The Diabetes Code and Bikman, B. Why We Get Sick

There are other proven but less impactful drivers, namely lack of exercise, high levels of stress, and limited sleep

The Three Main Health System Failures

- Very late detection (Glucose-centric approach—focusing on a downstream symptom)
- Failure in understanding and clearly communicating the lifestyle drivers of T2DM
- Subsidizing the causes of the disease (sugar, flour, corn/High fructose corn syrup)

A Shared Symptom

- Type 1 and Type 2 diabetes are the exact opposite diseases
- They share a symptom, high blood glucose (HbA1c)
- Type 1 diabetes is the lack of endogenous insulin
 - Pancreas does not produce enough insulin (or any)
 - Insulin is a survival hormone which takes glucose out blood into cells
 - Without insulin cells die, blood glucose and ketone levels rise
- Type 2 diabetes is too much endogenous insulin
 - Due to carbohydrate stimulus, insulin needs rise for 20 years leading to IR
 - Eventually IR leads to insulin insufficiency and blood glucose rises
- >Type 1 is not enough insulin, Type 2 is too much insulin
- Type 1 HbA1c rises fast, Type 2 HbA1c takes up to 20 years

The Lost 20 Years

• Medicine is too glucose-centric for type 2 diabetics, ignoring 20 years of hyperinsulinemia damage to the body



20 Years of Damage

- Hyperinsulinemia causes inflammation and is associated with:
 - Heart Disease (PMID: 12610041, 10704163, 10880413)
 - Strokes (PMID: 36589857, 19164796)
 - Obesogenic cancers (PMID: 11773152, 12509402, 12458975)
 - Fertility-related: PCOS for women and Erectile Disfunction
 - Brain Health Diseases and Ailments



Source: Bikman B. Why We Get Sick

Failure #1

Easy to Identify



- It was expensive to test insulin but no longer (\$30 for fasting insulin test)
- 15 Clinically easy to test/identify symptoms plus <u>family history</u>
 - <u>Waist-by-height</u> measure (PMID: 9061711, 22966093)
 - <u>Hypertension</u> (PMID: 12610041)
 - <u>Uric acid--gout</u> (PMID: 31028067)
 - <u>High triglycerides (PMID: 21208572)</u>
 - <u>Low HDL (PMID: 21208572)</u>
 - Non-alcoholic fatty liver disease (PMID: 38350680, 12107194)
 - <u>PCOS</u> for women(PMID: 9408743) and <u>ED</u> for men (PMID: 11416833)
 - 7 skin conditions: <u>Skin tags, acne, male-pattern baldness, acanthosis</u> <u>nigricans, hidradenitis suppurative, rosacea, and psoriasis/eczema</u> (PMID: 25977937, 19094069, 11030300, 21224180, 22188415, 15186199, 26299257, 23619434, 27328660, 25653028)



Blaming the Victim (Lifestyles)

- Genetics helps, but the real drivers are the food environment and lifestyle issues (CDC, WHO, ADA, everybody agrees, BUT)
- The lifestyle guidance provided has been:
- 1. Vague (Incompetence?)
- 2. Wrong (Corruption?)



Actual Lifestyle Drivers

Overwhelming Evidence of the Drivers (Pathophysiology of Type 2 diabetes and hyperinsulinemia)

- 1. What and How often we eat (THIS IS THE BIG ONE)
- 2. Lack of exercise/physical activity
- 3. High and sustained levels of stress (work and/or life)
- 4. Inadequate sleep

Failure #2 It is Carbs not Fat (Blaming the wrong Macronutrient)



ADA Approved Lies

Failure #2

Advice from an ADA-Endorsed Book	Reason it is not appropriate		
Page 5: "Eat a small meal every 2-3 hours". "always carry a snack with you."	Such an eating approach ensures that the pancreas is pumping insulin all day and increases the likelihood of hyperinsulinemia		
Page 6: "choose foods from the grain group, such air-popped popcorn, baked tortilla chips and salsa, graham crackers, pretzels, bagels, or cereal."	Most of what is listed is full of carbohydrates which becomes blood glucose very quickly. This requires large injections of insulin from the pancreas		
Pages 9: and 12: "eat foods low on fat" and "Increase monounsaturated fats like Canola oil"	Fat is the only macronutrient that does not lead to increased insulin. Furthermore, industrial seed oils like canola have been linked with increase insulin resistance .		
Page 14: "To increase fiber in your diet, eat more beans, oat bran, barley, orange (fresh), and oatmeal."	While fiber is effective in somewhat blunting blood glucose impact of some foods, for many diabetics, high glycemic index or load foods can still spike blood glucose even in the presence of some natural fiber and will require insulin.		
Page 19: "for breakfast choose whole grain cereal or an English muffin, low fat milk or yogurt, or fruit."	Foods with grain and fruit can produce large spikes of blood glucose in diabetics requiring insulin. Yogurt can be helpful if it is whole fat and with no added sugar, unfortunately, most commercially available yogurt have added sugar.		
Page 19: "Research has shown that sugar is ok for people with diabetes if it is part of a meal plan".	Sugar is the main driver of T2DM through both fructose and sucrose		

CDC Failure

US Centers of Disease Control. Prevention, Diabetes Prevention Recognition Program. 2021

- A 53-page document encourages the development of community programs for T2DM prevention and highlights the importance of "lifestyle" interventions, **but**..
- does not offer any specific detail about the types of interventions
- mentions food and diet only once by referring to eating lower fat, with no references to the actual drivers of T2DM, sugar/fructose and other carbohydrates
- all the clinical references are to blood glucose and <u>none to</u> <u>hyperinsulinemia and insulin resistance</u>



WHO Failure

Vague quotes from guidance on non-pharmaceutical approaches:

- "A <u>healthy diet</u> to achieve or maintain normal body weight and regular physical activity are the mainstay of diabetes management"
- "People with diabetes should be advised to eat a healthy balanced diet that is applicable to the general population"
- "Overweight patients should be advised to reduce weight by reducing their food (calorie) intake"
- More accurate on sleep, stress and exercise



Financing The Disease

- It can be argued that taxing tobacco has been one of the most successful Public Health Policy outside the health sector
- Taxing a product increase the price and lowers demand and use
- A subsidy does the exact opposite, lowering price and increase use
- It can be equality argued that <u>subsidizing carbohydrates (sugar,</u> <u>corn, flour) the world over has been the biggest public health failure</u> outside the health sector.

Financing The Disease

- Sugar and flour are subsidized in many countries in the name lowering the price of staples for the poor (<u>a terribly targeted pro-</u> poor strategy that causes disease at the population level)
- Corn subsidies in the US (done since the 1970s for political reasons) has led to cheap High Fructose Corn Syrup
 - The price of a bushel of corn is about a dollar less than the cost of growing it. So if the supply is so abundant that the market won't pay the cost of producing it, why do farmers keep growing more of it?
- Can we come up with pro-poor policies and instruments that are not pro-disease?

Islands of Success in an Ocean of Failure

- <u>Pills and Injections</u> are focused only <u>on blood glucose</u> and, more often than not, <u>increase all cause mortality</u>
- Behavior change (lifestyle) can be challenging for health care providers to pursue
- Health sector is rarely influential on tax/subsidy policies
- But there are some successes

Islands of Success in an Ocean of Failure



Can we do better?

- From upcoming DAH and T2DM paper:
- 1. Do No Harm
- 2. Transform Health Systems
- 3. Think Outside the Box (e.g. tax policy)
- 4. Map out how different lending instruments can be used