Challenges of diabetes

Key findings of the Swiss Re Institute and Harvard School of Public Health studies

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In collaboration with

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Cardiovascular disease, cancer and diabetes have become the leading causes of death in India and China.

Source: GBD Cause Patterns, University of Washington
Dietary risk and high plasma glucose are the top risks for mortality in India and China

Source: GBD Cause Patterns. University of Washington
Type 2 diabetes projections 2040 look very sobering

60% of the world population are in Asia, the largest diabetic population is also here, namely China and India.

In China and high income India we have over 10% type 2 diabetics but another 35% are at the verge of becoming diabetic.

<table>
<thead>
<tr>
<th></th>
<th>Overall (%)</th>
<th>Men (%)</th>
<th>Women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>10.4 (9.8–10.9)</td>
<td>11.1 (10.4–11.7)</td>
<td>9.6 (9.1–10.1)</td>
</tr>
<tr>
<td>Prediabetes</td>
<td>35.7 (34.1–37.4)</td>
<td>36.4 (34.6–38.2)</td>
<td>35.0 (33.4–36.7)</td>
</tr>
</tbody>
</table>

Hence we expect an increase by 2040 of type 2 diabetics of 37.5% in China and 78.5% in India compared to the US with 19.8%.

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2040</th>
<th>Increase (%)</th>
</tr>
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<tbody>
<tr>
<td>China</td>
<td>109.6 million</td>
<td>150.7 million</td>
<td>+37.5%</td>
</tr>
<tr>
<td>India</td>
<td>69.2 million</td>
<td>123.5 million</td>
<td>+78.5%</td>
</tr>
<tr>
<td>United States of America</td>
<td>29.3 million</td>
<td>35.1 million</td>
<td>+19.8%</td>
</tr>
</tbody>
</table>
Diabetes in India
With 65 million diabetics India is often referred to as the ‘diabetes capital’ of the world

**Chronic diseases in India: Burden and implications**
K. Srinath Reddy and Sailesh Mohan (Public Health Foundation of India)

- India is on the cusp of health change
- It has both extensive recent urbanisation; with continuing widespread near-subsistence agriculture in basic conditions
- Infectious disease is still a serious public health concern; but the spread of NCDs is rapid
- Diabetes is spreading so rapidly that India that it is projected to increase to 109 million diabetics by 2035
India's nutrition transition is shadowed by a sudden steep increase in type 2 diabetics

The nutrition transition in India: Trends in dietary intake and associations with cardiometabolic outcomes
Shilpa Bupathiraju (Harvard T.H. Chan School of Public Health)

The spread of type 2 diabetes in India has mainly been related to changes in diet

- In the last five decades, the production of sugar among Indians has risen from less than 3% to 20% of sugar produced globally
- Urban participants reporting up to 35% higher sugar intake than their rural counterparts
- High intakes of dietary fiber are associated with a 69% lower odds ratio of type 2 diabetes
Supply of coarse cereals has declined drastically while consumption of milled rice has significantly increased

- Shift to white rice consumption results in a high glycaemic load which is associated with a 13% higher risk of type 2 diabetes

Source: S. Bupathiraju, RDS Health Risk Factors India, Swiss Re
Shift from the fresh market to processed potato products lead to high glycemic index and glycemic load exposure

Substituting one serving of whole grains for one serving of potatoes is associated with a 30% higher risk for type 2 diabetes

Source: S. Bupathiraju, RDS Health Risk Factors India, Swiss Re
Sugar consumption has significantly increased through consumption of sweets, baked goods, candies, ice cream and soft drinks

A 20% sugar-sweetened beverage excise tax would be expected to prevent 400'000 cases of type 2 diabetes over the next decade

Source: S. Bupathiraju, RDS Health Risk Factors India, Swiss Re
Diabetes in China
About 90 mio Chinese live with type 2 diabetes and another 150 mio have pre-diabetes

Trends of diabetes risk factors in China
Yanping Li, Sylvia Ley, Frank Hu (Harvard T.H. Chan School of Public Health)

Several risk factors contribute to this diabetes epidemic in China, including:

- improved life expectancy
- rapid urbanisation
- increased overall and abdominal obesity
- decreased physical activity levels
- high prevalence of cigarette smoking
- increased adoption of a westernised diet
Risk factor trends 1991 to 2031

- Physical activity drops (190 Met-hours weekly)
- BMI increases (av 23.5 kg/m²)
- Smoking decreases but remains high (53% of males)
- Systolic blood pressure increases

All 2011 figures
# Risk factors and their effect on diabetes

<table>
<thead>
<tr>
<th>Lifestyle and metabolic factors</th>
<th>Relative Risk of Diabetes (95% CI)</th>
</tr>
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<tbody>
<tr>
<td>High blood pressure (18) 20mmHg</td>
<td>+58%</td>
</tr>
<tr>
<td>Current smoking (19) Yes vs. No</td>
<td>+37%</td>
</tr>
<tr>
<td>High body mass index (BMI) (9) 1kg/m²</td>
<td>+18%</td>
</tr>
<tr>
<td>Physical inactivity (11) MET-h/w</td>
<td></td>
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**Moderate dietary factors**
- Processed meat (27) 100 g/d
- Red meat (27) 100g/d
- SSB (26) 250 g/d
- Refined grain (25) 63.2 g/d

**Adequate dietary factors**
- Fiber (20) 10g/d
- Fruit (23) 340 g/d
- Vegetable (23) 250 g/d
- Low-fat dairy products (22) 245 g/d
- Fish and seafood (24) 100 g/d
- Nuts (21) 16.2 g/d
- Whole grain (29) 90 g/d
Can type 2 diabetes be managed or reversed with carbohydrate restriction?

New ways of managing diabetes
John Schoonbee (Swiss Re)

Before the insulin era, fasting and low carbohydrate intake was all that was effective for managing diabetes

Diabetes vicious cycle
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