Population studies of diabetes in Greenland

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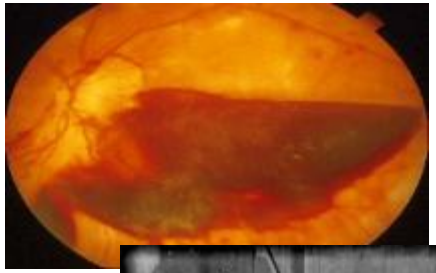
steno diabetes center

Diabetes is a serious disease

- 5 million annual deaths (8.2% of all)
- 3-4 fold risk of cardiovascular disease



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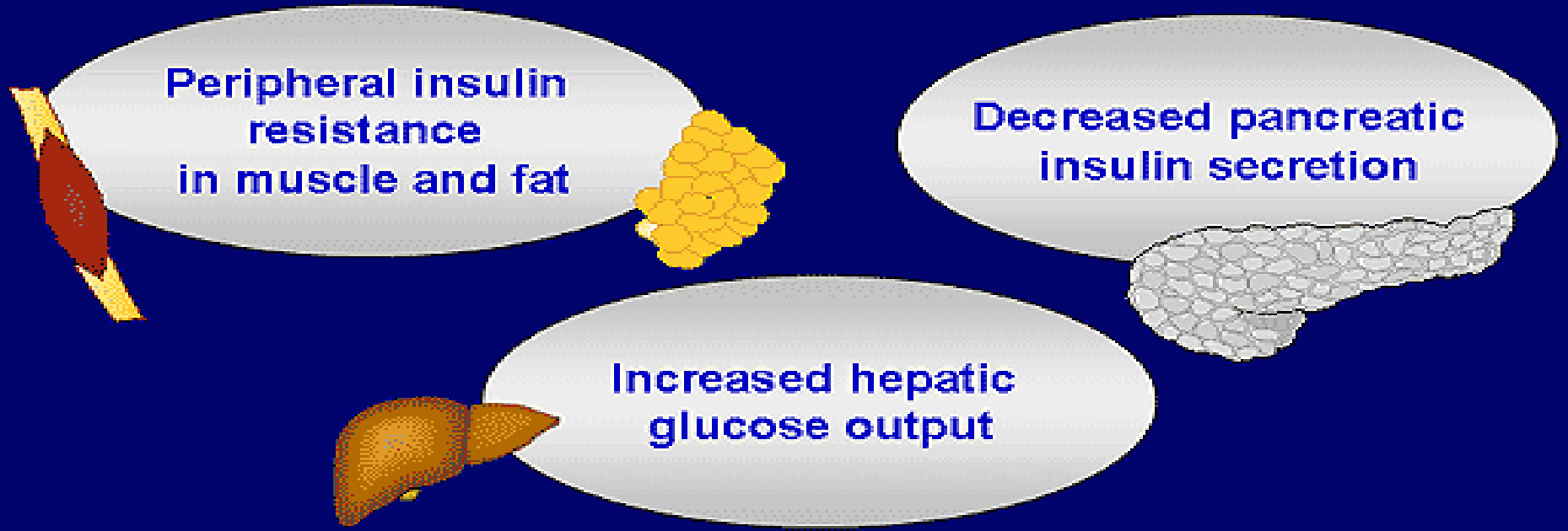
Metabolic Defects in Type 2 Diabetes

- a multiorgan disease



Haffner *Diabetes Care* 1999

Gut, kidney, brain, others ?

Cross sectional studies of diabetes among Inuit

- 1962, Sagild, Greenland — DM: 0.06 %
- 1962, Murphy, Alaska — DM: 1.7 %
- 1962, Mouratoff, Alaska — DM: 3.9 %
- 1983, Stepanova, Siberia — DM: 4.9 %
- 1983, Thouez, Canada — DM: 0.4 %
- 1987, Murphy, Alaska — DM: 4.7 %
- 1988, Murphy, Alaska — DM: 3.7 %
- 1994, Ebbesson, Alaska — DM: 6.6 %

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The population study in Greenland 1999 (B99)

- **Nuuk**
13.000 inhabitants
443 participants

- **Qasigiannguit**
2500 inhabitants
618 participants

- **Uummannaq**
1700 inhabitants
256 participants from four villages

- **Denmark**
995 participants

Inuit Health in Transition 2005-2010

- A study of 3102 adults in Greenland
- A study of the impact of lifestyle changes on chronic disease
- Focus on the association between diet, obesity, physical activity and diabetes and cardiovascular disease

Diabetes research in Greenland 1999-2013

Cross sectional studies of diabetes among Inuit

- 1962, Sagild, Greenland — DM: 0.06 %
- 1962, Murphy, Alaska — DM: 1.7 %
- 1962, Mouratoff, Alaska — DM: 3.9 %

70% of cases were previously unknown!

- *1999, B99, Greenland* — DM: 10 %
- *2010, IHIT, Greenland* — DM: 10 %

Jørgensen Diabetes Care 2002, Jørgensen Diabetic Medicine 2012

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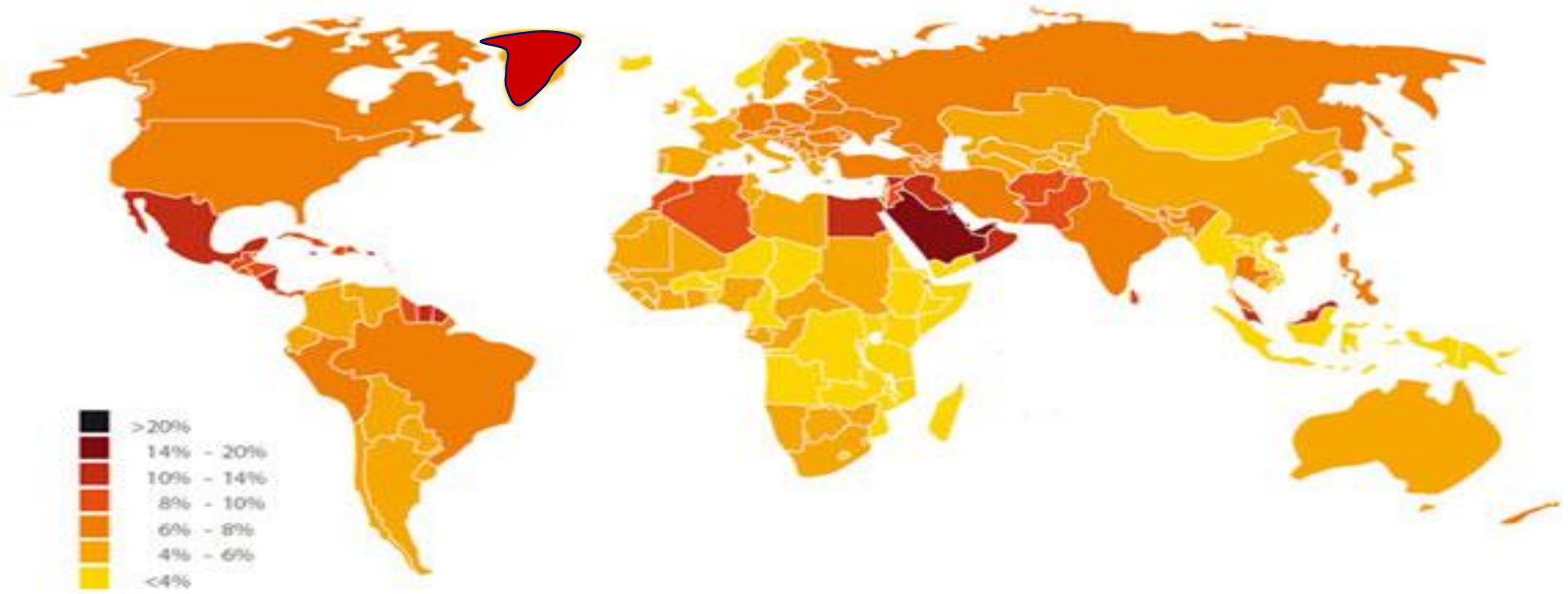
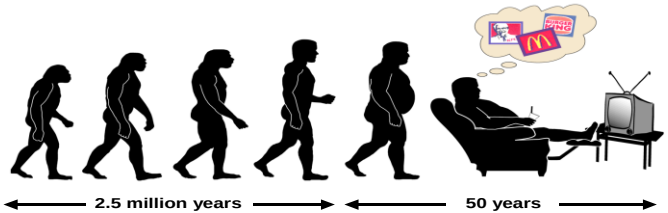
Prevalence estimates of diabetes, 2007



SOURCE: *DIABETES ATLAS THIRD EDITION*, © INTERNATIONAL DIABETES FEDERATION, 2006

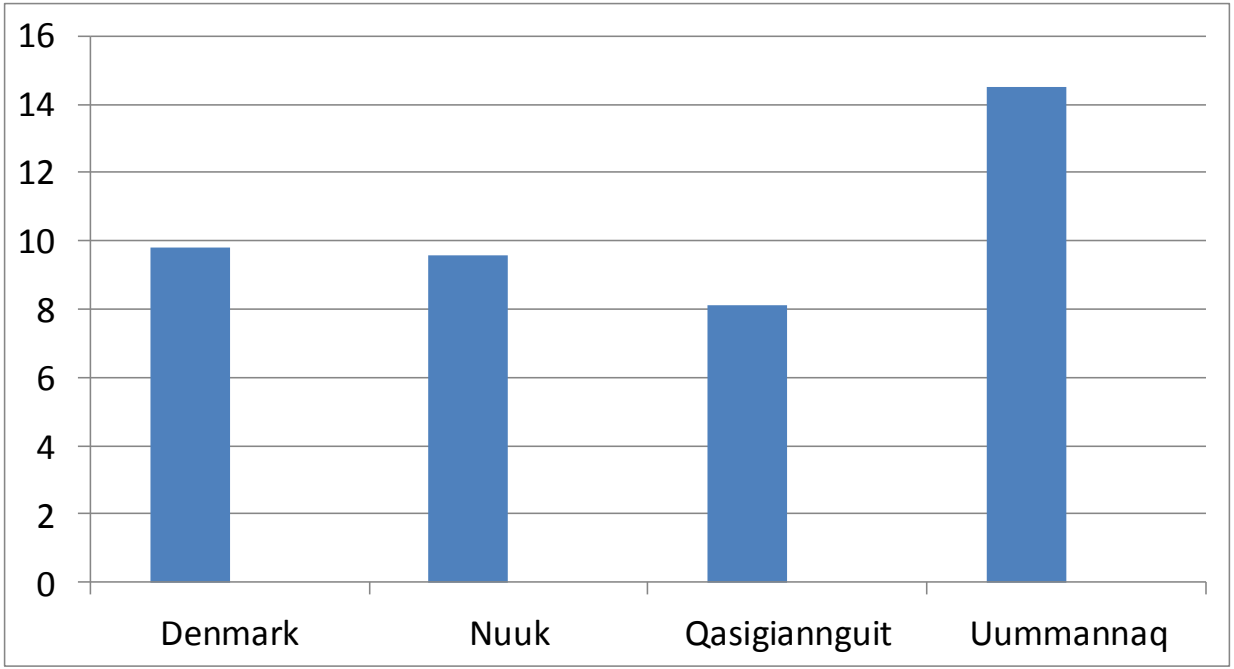
Risk factors for diabetes

- Age
- Obesity
- Physical inactivity
- Hepatic insulin resistance
- Insulin insufficiency



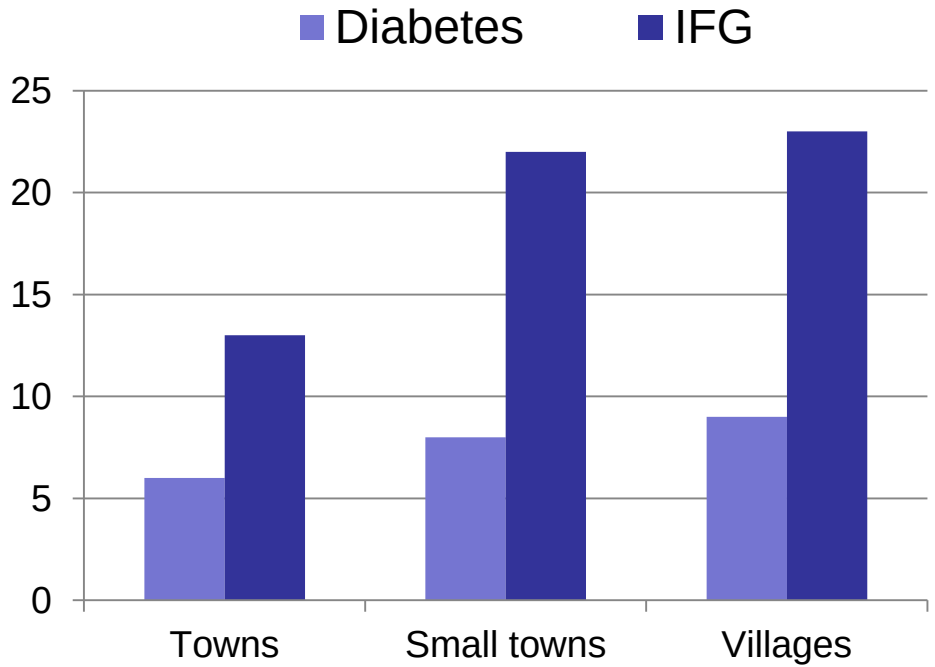
Jørgensen et al, Diabetes Care 2002

Diabetes in the four areas (B99)

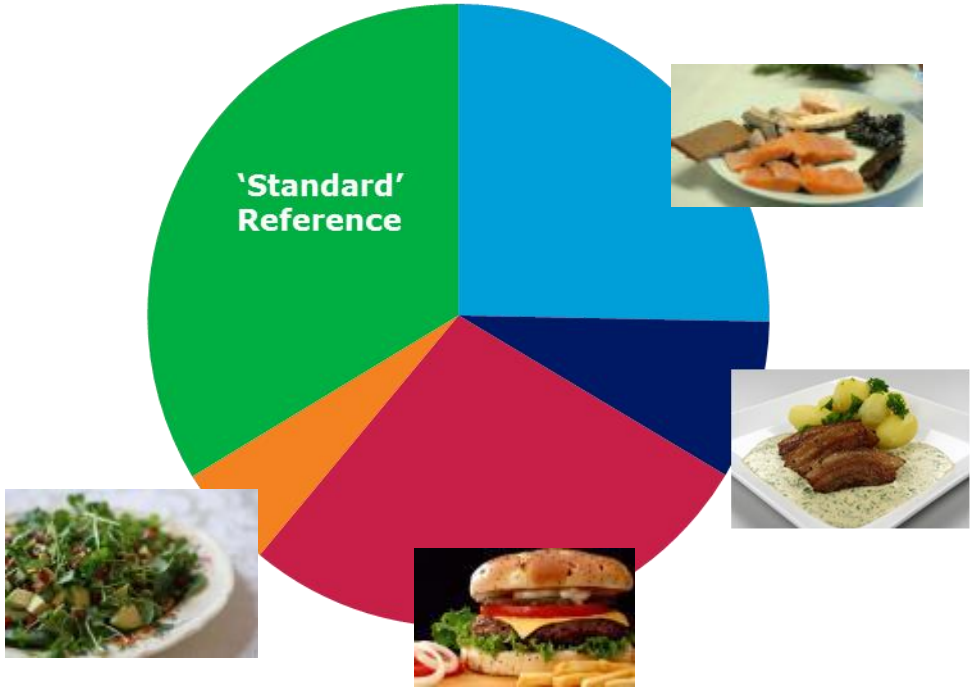


Jørgensen et al, Diabetes Care 2002

Urbanisation and diabetes –
The Inuit Health in Transition Study 2005-2010



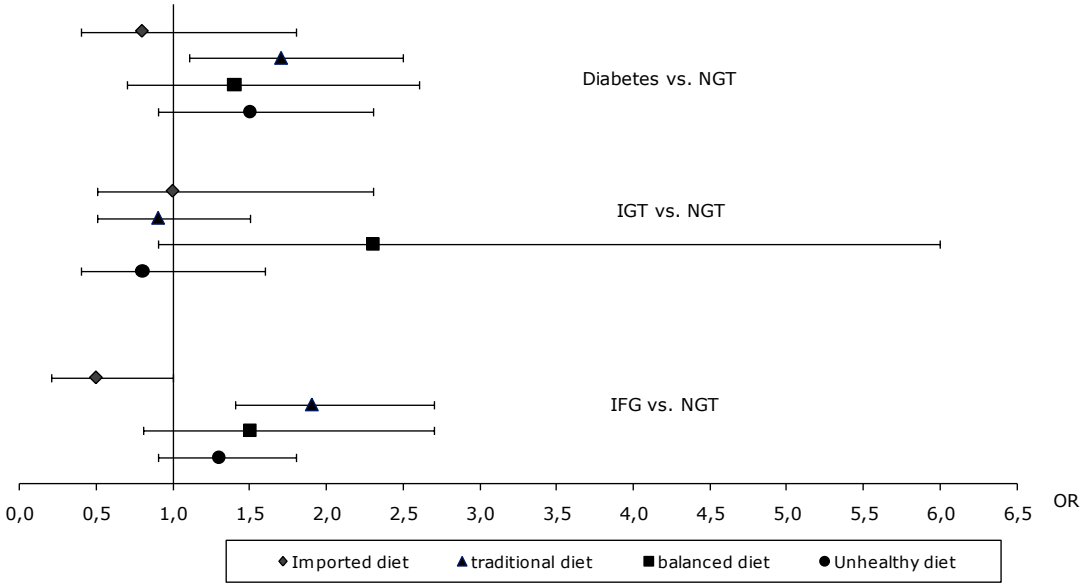
Dietary patterns in Greenland



- Traditional
- Imported
- Unhealthy
- Balanced
- Standard

Jeppesen et al. Public Health Nutr. 2013 11:1-9

Dietary pattern and glucose intolerance



Jeppesen et al. Public Health Nutr. 2013 11:1-9

Risk of diabetes and urbanisation in Greenland

- URBAN
  - Low physical activity level
  - High calorie intake
  - Peripheral insulin resistance
  - Low vitamin D levels
  - Better education
  - Better health care service
  - High socio-economic status
- RURAL
  - High physical activity level
  - High calorie intake
  - Low beta-cell function
  - High levels of ‘POPs’
  - Lower birth weight
  - Limited access to health care
  - Low socio-economic status

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Conclusion and perspectives

- High prevalence of Diabetes in Greenland
- Complex association between westernisation and glucose intolerance
- Future research will focus on:
  - Genetic factors in diabetes and metabolic risk
  - The role of low-grade inflammation, infectious diseases and diabetes
  - The role of birth weight in obesity, diabetes and CVD
  - Long-term complications to diabetes

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Thanks for your attention