



# THE GUT MICROBIOME, A TARGET FOR BETTER HEALTH

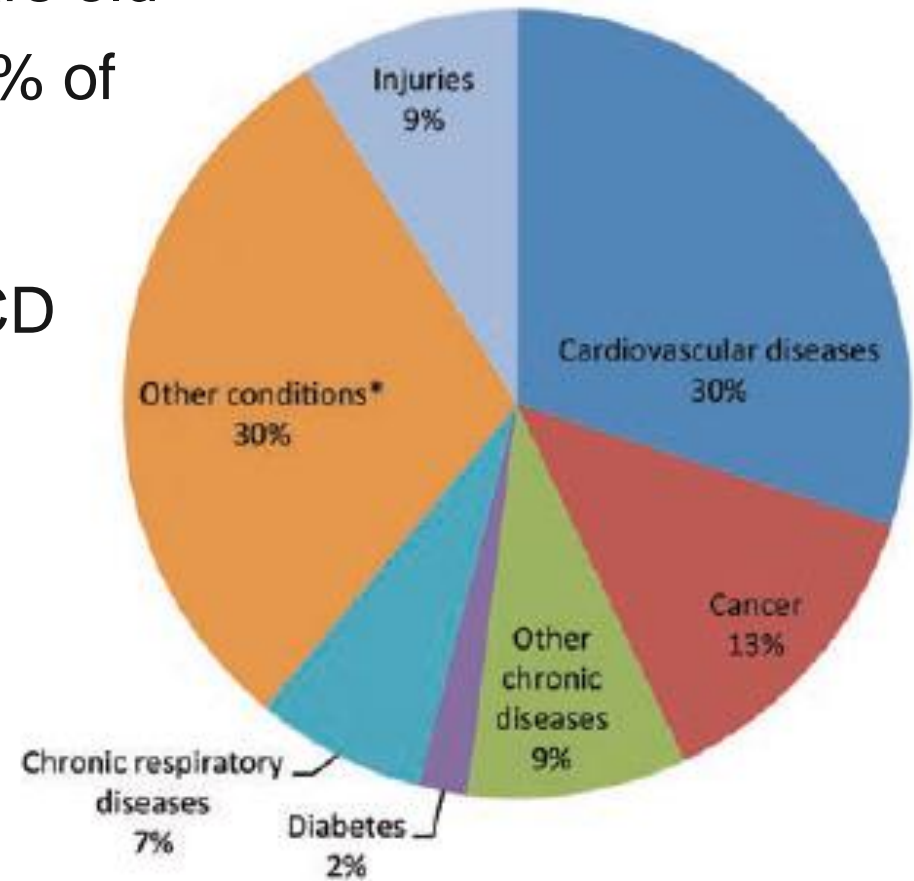
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Microbiome-based Foods for Health and Sustainability  
23 February 2016



# NCD – A Global health challenge

- Largest cause of death 63% of global deaths of which 25% before 60 years old
- 48% of healthy life years lost vs 40% of other diseases
- Non Communicable Diseases – NCD
  - Cardio Vascular diseases
  - Diabetes
  - Cancer
  - Chronic respiratory diseases
  - Neurological disorders
- 2011 : 2<sup>nd</sup> UN high level Health meeting on NCD





# NCD – A Global health challenge

- Population growth
- Ageing
- Obesity
  - 1% to 3% of total health expenditure (5% to 10% in US)
  - Obese person incurs health care expenditures at least 25% higher

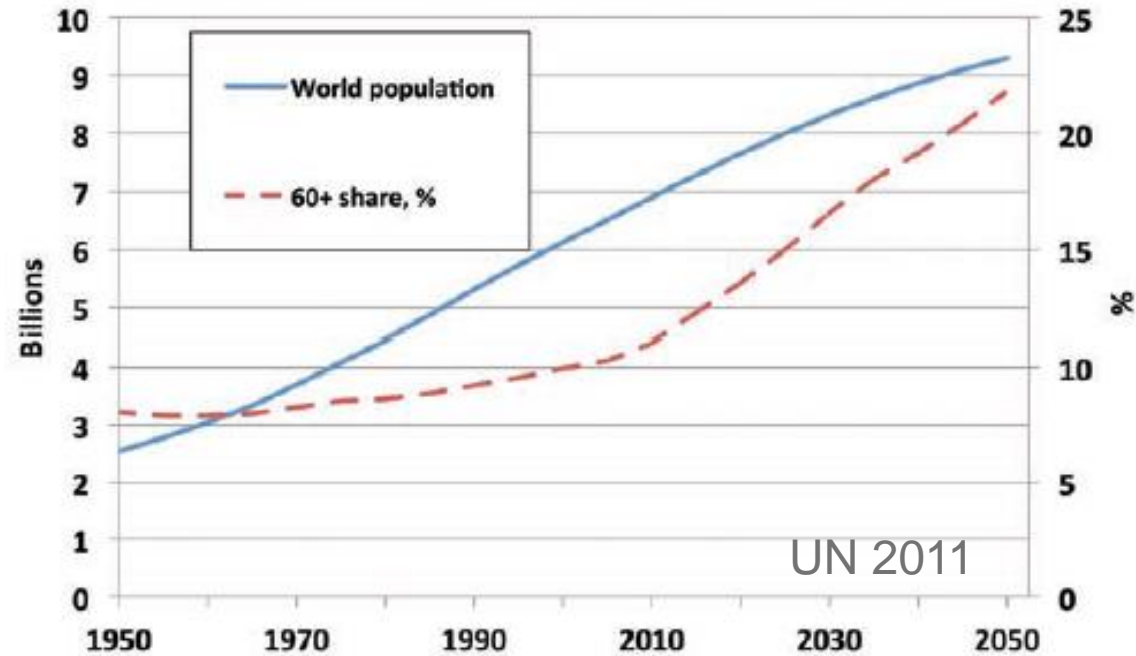
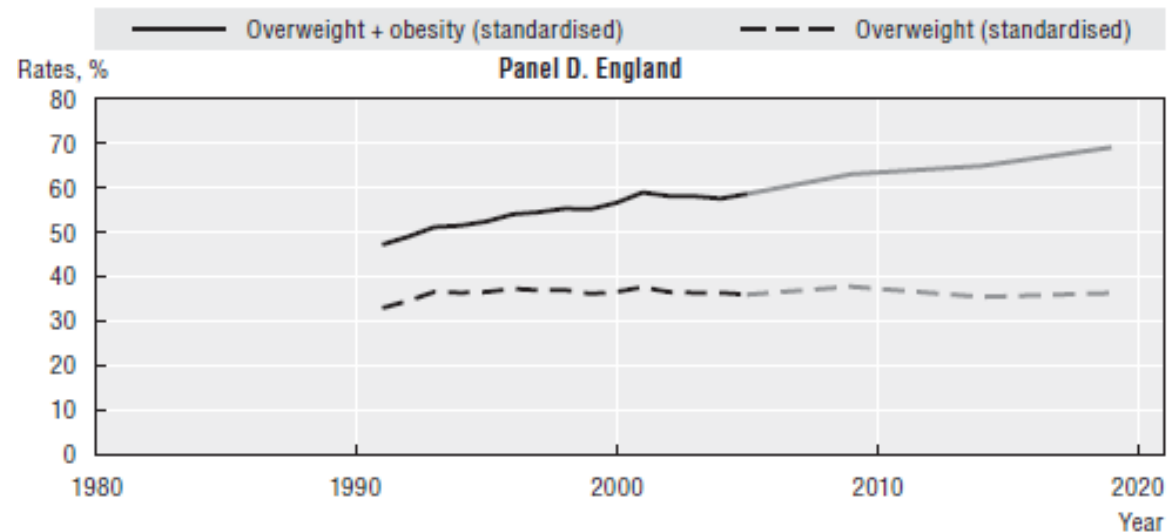


Figure 2.6. Past and projected future rates of obesity and overweight, age 15-74, selected OECD countries (cont.)





# Healthcare cost challenge

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- NCD cumulative output loss by 2030 expected :
  - 47 trillion USD = 75% of the global GDP in 2010
- 2008 1.5 billion adults had overweight
- 2010 43 million children under 5 years old had overweight (WHO, 2013 )
- Eliminating the risk to NCD :
  - reduce CVD and diabetes by 75% and cancer by 40%
- Dementia : global cost in 2010 was estimated to be USD 604 billion
  - By 2030, prevalence within the whole population is set to rise by 50% in high-income countries and 80% in low and middle income countries



# Healthcare cost challenges

- Malnutrition



USD 3.5 trillion/yr  
to global economy

USD 2.1 trillion/yr  
to global economy

USD 1.4 trillion  
in 2010

Child and maternal malnutrition:  
Largest nutrition related  
health burden

<http://www.fao.org/zhc/detail-events/en/c/238389/>

Prevention includes **diet** and target the **gut microbiome**



# The gut microbiome as a target

Genes & Diseases (2014) 1, 132–139

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REVIEW ARTICLE

## Exploring gut microbes in human health and disease: Pushing the envelope

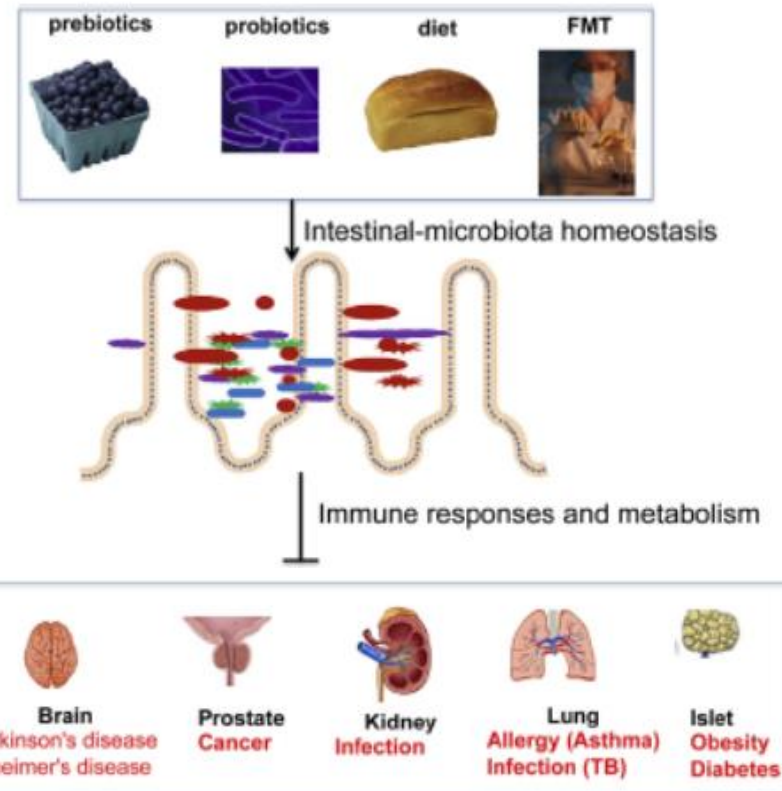
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**Figure 2** Targeting the gut microbiota in prevention and treatment of human diseases. Prebiotics are non-digestible carbohydrates fermented in gut that selectively stimulate the growth and/or activity of a limited number of bacteria and thereby, confer health benefits on the host. Probiotics are live microorganisms, which, when administered in adequate amount, confer a health benefit on the host. Personalized dietary and fecal microbiota transplantation (FMT)/of healthy donor feces to patients are used to prevent or treat diseases through restoring healthy host-bacterial interactions.



# THE 2013 STATE OF THE UNION

***“Every dollar we invested to map the human genome returned \$140 dollars to our economy”***



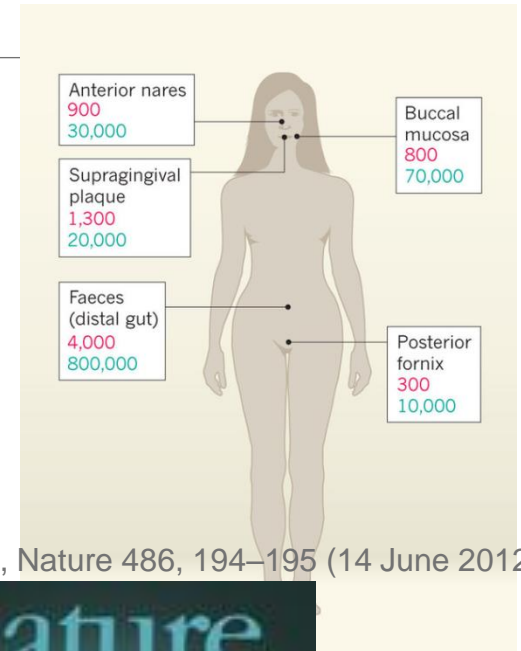


# From genomics to microbiomics

- **IHMC** - International Human Microbiome Consortium
  - Common set of principles and policies to understand the role of the human microbiome in the maintenance of health and cause of disease
  - Coordinate activities and policies of international groups working on the microbiome
- **HMP** – Human Microbiome Project (NIH 2008)
- **MetaHIT** FP7
- JP, CA, DE, UK, ...
- **MyNewGut** (EC 2013)
- **JPI – Healthy Diet for Healthy Life**: Joint action of Intestinal Microbiome (2015)
  - EUR 7M EUR call
  - effects of diet on intestinal microbiota
  - Diet - microbiota -human health / NCD

2015 call for a **Global Microbiome effort**

UMI-IMI



Relham, Nature 486, 194–195 (14 June 2012)



Nature 486 (2012)



# The gut microbiome as a target – Policy ?

- **Research needs**
  - Understanding the gut microbiome as a functional organ
  - Interplay diet – gut microbiota
  - Causal relationship gut microbiota and health and disease
    - International collaboration
    - Access to data – large data
- **Towards personalised diets?**
  - In preventative medicine
  - In curative medicine
- **Regulatory – ensuring the science base**
  - Food or medicine?
  - Harmonisation of regulation?
  - Defining FSMP, nutraceuticals, functional foods, ...
- **Barriers for innovative approaches**
- **Uptake of novel food and diet by the public**





# Workshop: The Microbiome, Diet and Health: Assessing Gaps in Science and Innovation

- Human gut microbiome: potential for healthier foods and innovative medicines?
- Personalised diet and new foods
- Regulatory and enabling frameworks
- Policy opportunities and needs





THANK YOU