

Welcome
by
Pál Weihe

A cordial welcome to you all from near and far - to those of you who are already here and those who are on their way.

It is a great honour and pleasure for me to welcome you to Tórshavn, the capital of the Faroe Islands. In the introduction to his novel “The Lost Musicians”, William Heinesen, one of the city’s poets, writes – *“far away in the mercury shimmering ocean there is a lonely lead-coloured land. This tiny little rocky land relates to the wide ocean as a grain of sand to a ballroom floor, but viewed through a magnifying glass this grain of sand is yet a complete world with mountains, valleys, sounds and fjords and houses with little people”*.

I know Heinesen was a wise man, but that he could foresee that mercury would be one of the key characteristics when describing these islands is astounding. Because it is the light on mercury in our environment which is the primary reason for this conference being held in Heinesen’s capital – and renders this land mercury shimmering. It was Professor Kim Brøsen, editor of Journal of Basic & Clinical Pharmacology & Toxicology who, on behalf of his Board, offered a substantial contribution to a scientific conference in the Faroes. The subject we chose was the research area that my good colleague Philippe Grandjean and I have cooperated on for more than two decades. Thanks to Kim Brøsen and his Board for their generosity. Also a big Thank You to all sponsors, who have joined in along the way.

A special ‘thank you’ to all the people who have made this conference possible: The organisational committee, the scientific committee, and not least our secretariats. I have followed the Faroese secretariat at a close level and I can tell you that I have witnessed a passion and dedication to the work that has been impressive and self-sacrificing, especially Mrs. Renate Simonsen from Faroe Travel has worked long hours for months and so has Mrs. Elsa Olsen from the Department of Occupational Medicine and Public Health.

Thanks to you all, presenters, sponsors, organizers, all of you who made it possible to launch this scientific conference, the subject of which is fundamental – the impact of the environment on the future health of our children.

It is my hope that your stay in this little rocky land will be an enrichment to you, first and foremost scientifically, but also that you will take some time to view the “grain of sand” in the wide ocean far away through the magnifying glass and find a complete world with mountains and valleys, sounds and fjords and houses with people inside.



Deildin fyri Arbeiðs-
og Almannaheilsu



The Faroe Islands in Biomedical Research

Pál Weihe

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The Faroes - a Welfare Society

- Home rule within the kingdom of Denmark
- 50.000 inhabitants
- Seafood dominating export
- Free education
- Free health care
- Retirement pension for all

University of Faroe Islands

- Founded in 1965
- Faculties: Faroese Language & Literature
Science and Technology
History and Social Science
- Professors (all levels): 25

The Faroese Health Care System

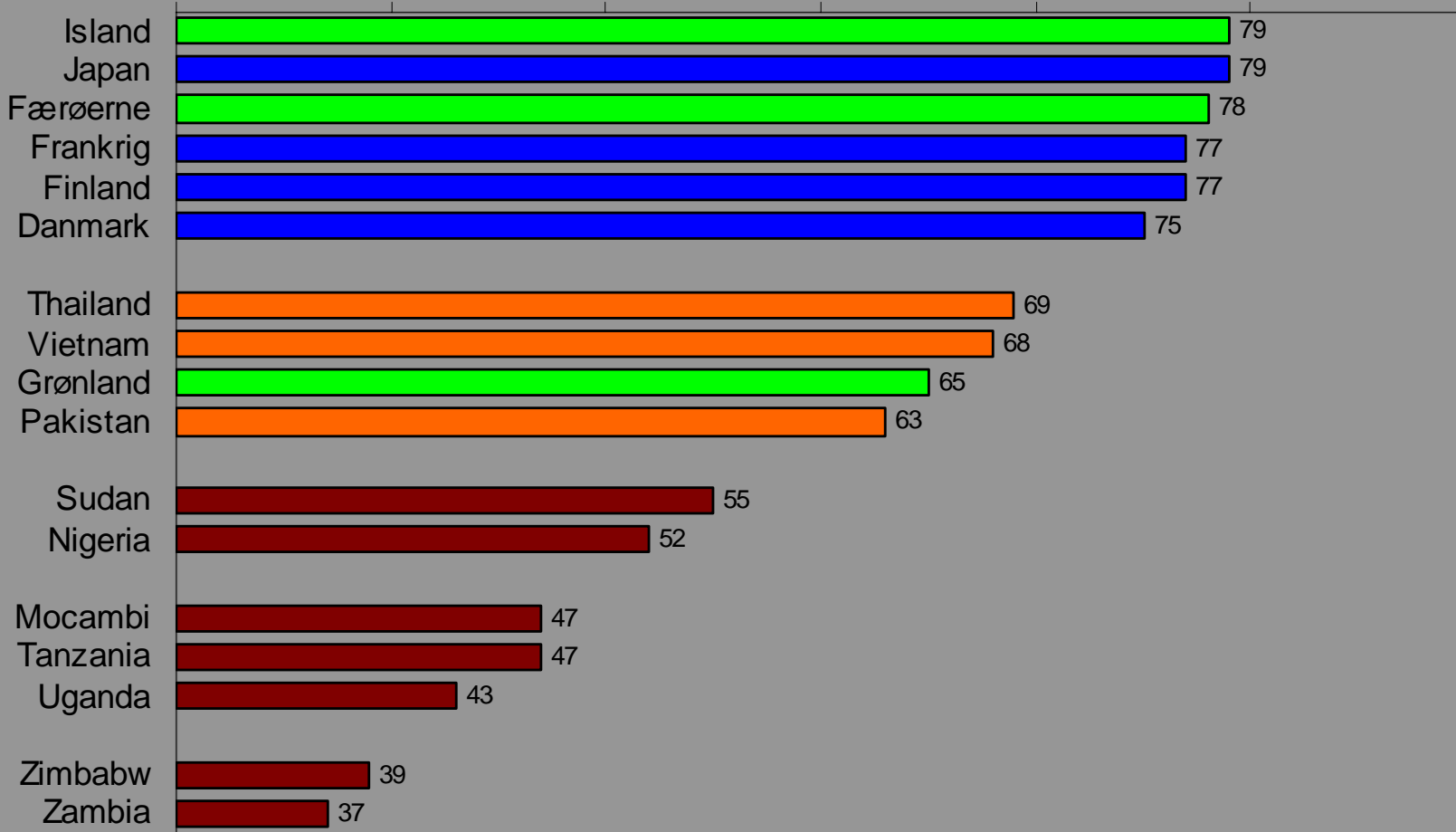
- Physicians: 100
- Dentists: 40
- Pharmacists: 13
- Sub-specialist conditions referred to the National Hospital of Denmark.

Health indicators

- Perinatal mortality: 4,1 (2000-2005)
- Life expectancy at birth: 81/77 (women/men)
- Cause of death distribution similar to Scand.
- Tobacco : 27 % daily smokers
- Alcohol consumption: 6,7 liter/person/year

Average life expectancy

30 40 50 60 70 80 90



Faroese Biomedical Research

- Case reports
- Comparative cross sectional studies
- Longitudinal studies

Peter Ludvig Panum (1820-1885)

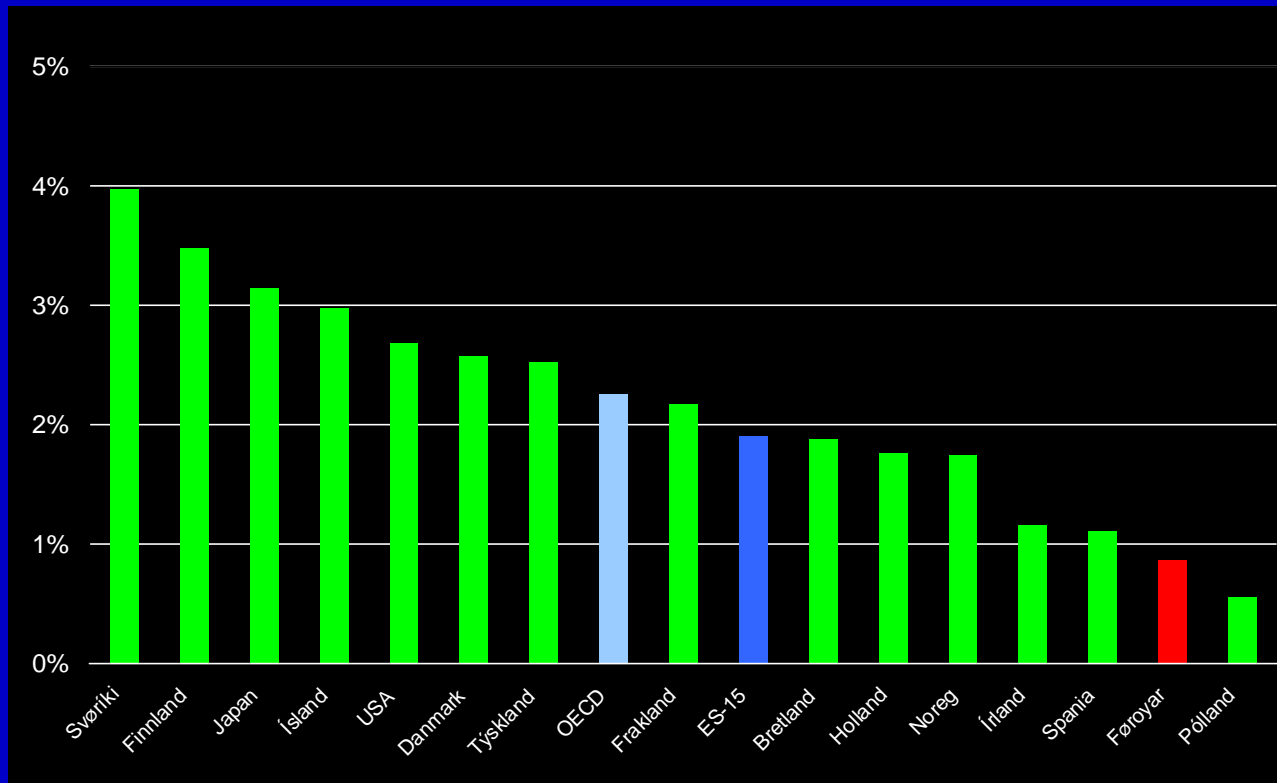
- Panum and his colleague A.H. Manicus showed that the measles epidemic in 1846 affected the entire population of the Faroese islands with the exception of the very old (those born prior to the preceding epidemic in 1781).



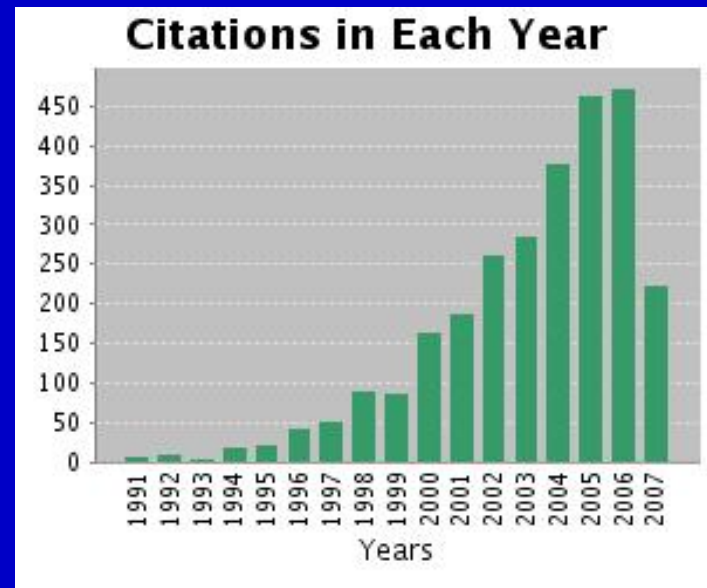
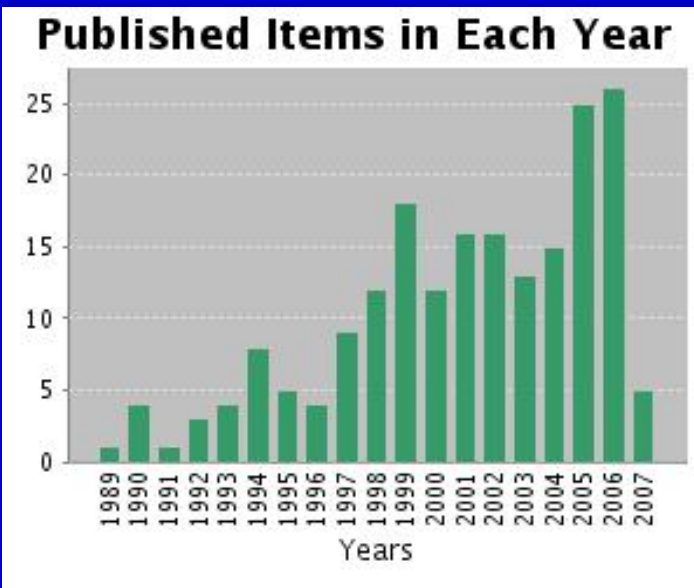
- **Niels Ryberg Finsen** (1860 – 1904) was born and raised in the Faroe Islands.
- The Nobel Prize in Physiology or Medicine 1903 "in recognition of his contribution to the treatment of diseases, especially lupus vulgaris, with concentrated light radiation, whereby he has opened a new avenue for medical science"



Expenses to R&D in 2003, % of GDP



Publications with Faroese institutions involved 1990 -2007 (Web of Science)



Academic subject areas	No	%	Bar
MARINE & FRESHWATER BIOLOGY	35	17.8	■
PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH	32	16.2	■
ENVIRONMENTAL SCIENCES	29	14.7	■
GENETICS & HEREDITY	28	14.2	■
OCEANOGRAPHY	27	13.7	■
FISHERIES	20	10.1	■
NEUROSCIENCES	19	9.6	■
ECOLOGY	18	9.1	■
BIOCHEMISTRY & MOLECULAR BIOLOGY	12	6.1	■
TOXICOLOGY	12	6.1	■
PSYCHIATRY	11	5.6	■
GEOSCIENCES, MULTIDISCIPLINARY	10	5.1	■
GEOGRAPHY, PHYSICAL	7	3.6	■
CLINICAL NEUROLOGY	6	3.0	■
PEDIATRICS	5	2.5	■
ZOOLOGY	5	2.5	■
ENDOCRINOLOGY & METABOLISM	4	2.0	■
HEMATOLOGY	4	2.0	■
MULTIDISCIPLINARY SCIENCES	4	2.0	■
FOOD SCIENCE & TECHNOLOGY	3	1.5	■
GASTROENTEROLOGY & HEPATOLOGY	3	1.5	■
ANESTHESIOLOGY	2	1.0	■
BIOLOGY	2	1.0	■
CELL BIOLOGY	2	1.0	■
ENGINEERING, ENVIRONMENTAL	2	1.0	■

Citations 1990-2007 (Web of Science)

	Faroe Islands	Seychells	Iceland
Publications	197	188	5.808
Sum of the times cited	2.771	1.926	89.111
Average Citations per Item	14,07	10,24	15,34

- Cohort 1 born in 1986-1987 (N = 1022):
pre- and postnatal exposure to methylmercury and neurobehavioral development, examined at ages 7 and 14, and now again at ~21 years (2007-2009)
- Cohort 2 born in 1994-1995 (N = 182):
PCB and xenoestrogen exposure, frequent follow-up, most recently at ages 7 and 10 years
- Cohort 3 born in 1999-2001 (N = 650):
food contaminants, overall development, neurotoxicity and immunotoxicity, follow-up at ages 5 years and (now) 7 years
- Cohort 4 born in 2007-2008 (N ~ 500):
endocrine disruption, neurotoxicity

Specimens obtained for mercury analysis in the Faroes study

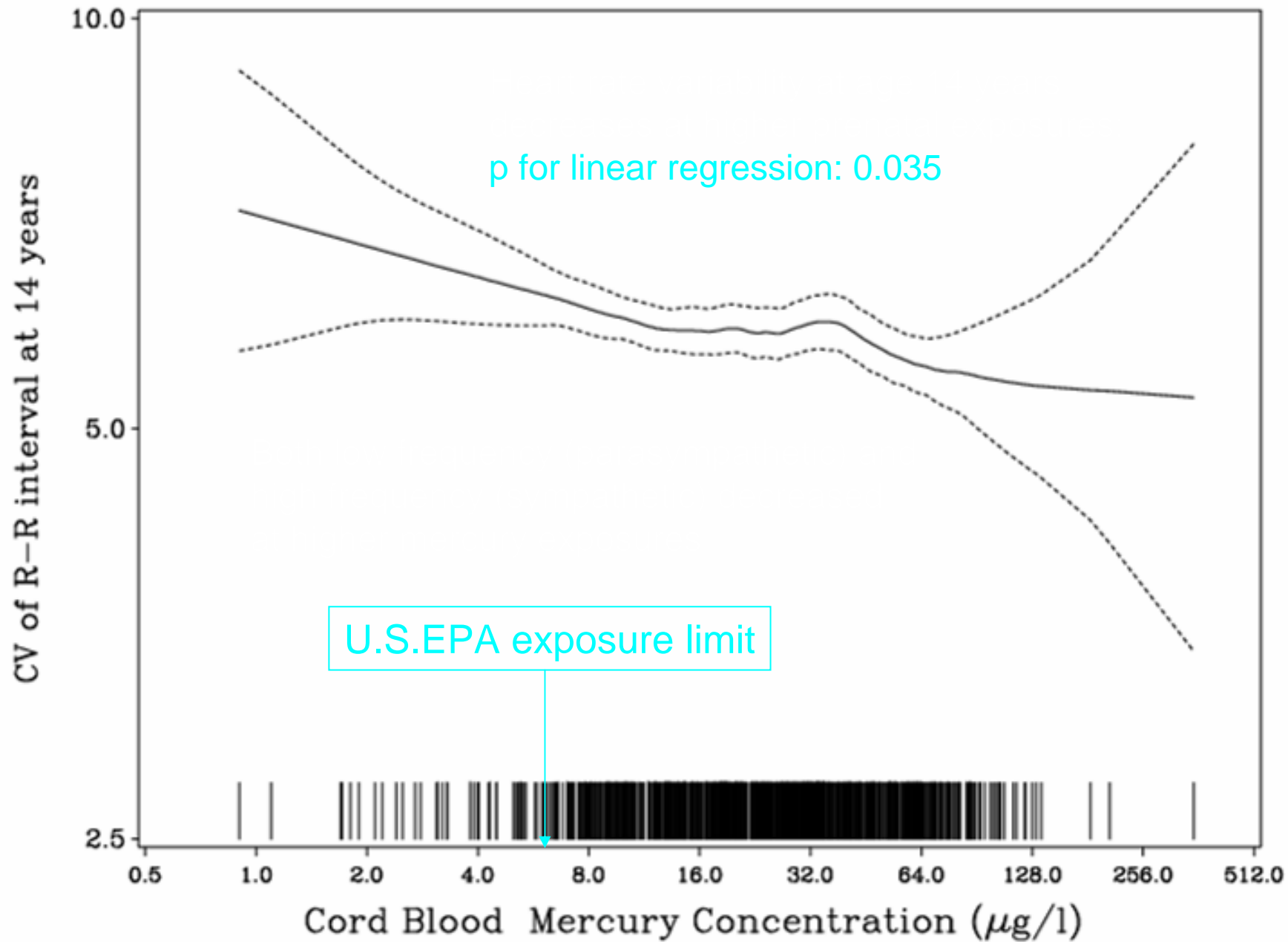
- Cord blood
- Cord tissue
- Maternal Serum
- Maternal Milk
- Maternal hair at parturition
- Child hair at 12 months
- Child blood and hair, 7 years
- Child blood and hair, 14 years



Neuropsychological tests are used to assess mercury-linked delays in development.

In Faroese children at age 7 years, each doubling of prenatal exposure corresponds to:

Motor function	0.9 month delay
Attention	1.3 -
Visuospatial function	0.6 -
Language	1.6 -
Verbal memory	2.0 -



The plans of the Government for further development

- Science park: a sketch plan is produced and the government supports establishing a science park in Tórshavn
- Vision 2015: a working group has recommended 3 % of the GDP to R&D with emphasis on marine biotechnology and genetics
- Genetics Resource Centre

Genetics Resource Centre (GRC)

Governmental institution: Started June 2006 – in the process to establish 3 registries:

- Biobank / Tissue Registry
- Diagnosis/Clinical Registry
- Genealogy Registry (covering ~400 years)

Faroese is regarded as a genetic isolate with a strong founder effect. GRC processes applications from researchers/research-entities to study the info/materials in the said registries.

The GRC has the right according to law to obtain all relevant personal data and diagnoses from all branches within the National Health Care system (including National Pharmacy, GPs and Specialists)

The GRC appoints Clinical Responsible's in the Health Sector – which verifies info and handles patient contact (collects blood) and has access to tissue banks in the public health care system.

- 2007 – Pilot projects
- 2008 – Fully Operational
- Homepage: www.genetics.gov.fo

The Research-team in 2000

