UNIVERSITÄTS KLINIKUM FREIBURG

Mini-symposium of the STRATOS initiative

Guidance on modern statistical methods for practical use

Willi Sauerbrei

Michal Abrahamowicz, Ruth Keogh

STRATOS INITIATIVE

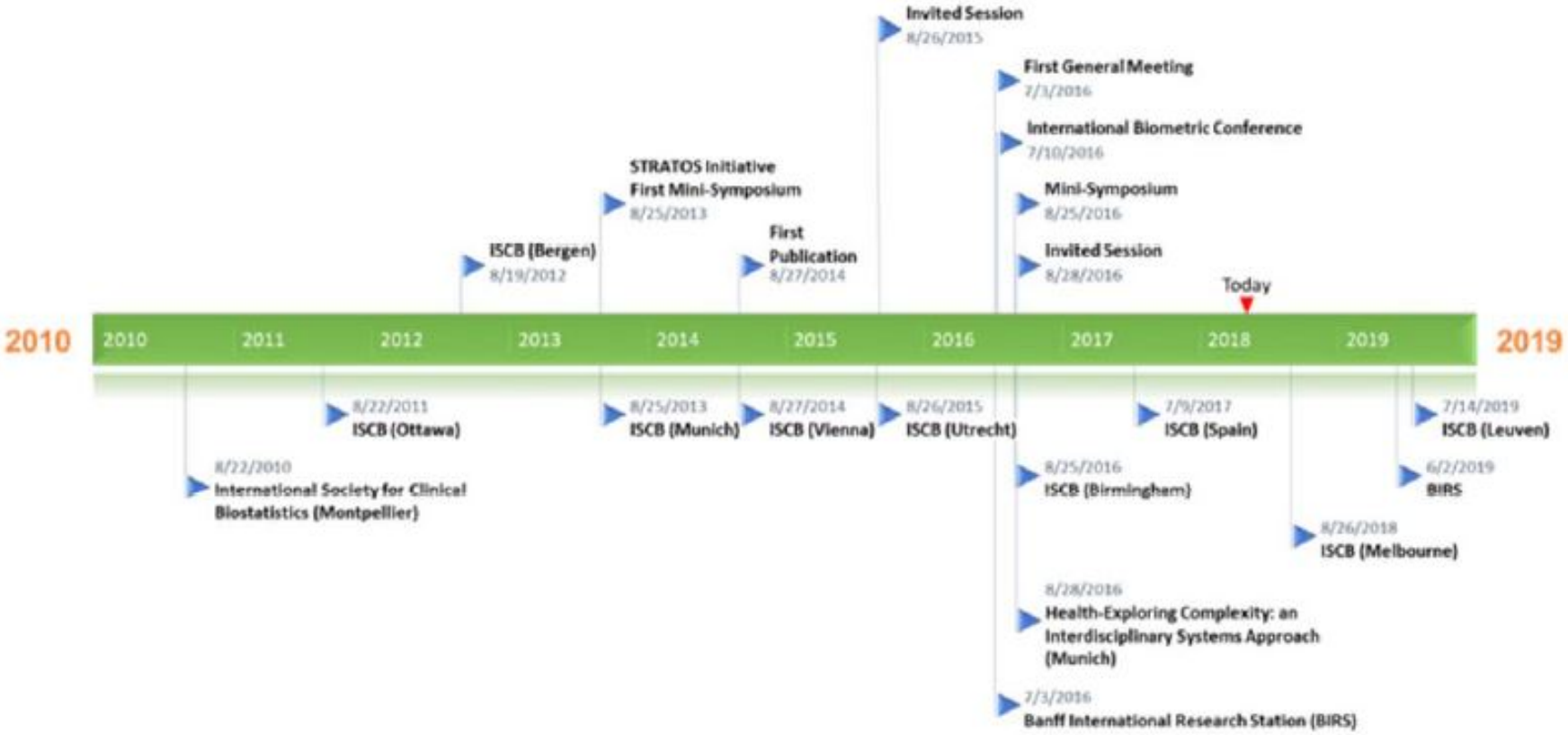
The STRATOS Initiative – Motivation, Mission, Structure and Main Aims

From Willi Sauerbrei, Michal Abrahamowicz and Saskia Le Cessie, for the STRATOS initiative

ISCB News #62, 6-7, Dec. 2016

STRATOS as an intellectual child of ISCB

The STRATOS initiative



Much has happened in the topic groups

Topic Group		Chairs
1	**Missing data**	James Carpenter, Kate Lee
2	**Selection of variables and functional forms in multivariable analysis**	Georg Heinze, Aris Perperoglou, Willi Sauerbrei
3	**Initial data analysis**	Marianne Huebner, Saskia le Cessie, Werner Vach
4	**Measurement error and misclassification**	Laurence Freedman, Victor Kipnis
5	**Study design**	Mitchell Gail, Suzanne Cadarette
6	**Evaluating diagnostic tests and prediction models**	Gary Collins, Carl Moons, Ewout Steyerberg
7	**Causal inference**	Els Goetghebeur, Ingeborg Waernbaum
8	**Survival analysis**	Michal Abrahamowicz, Per Kragh Andersen, Terry Therneau
9	**High-dimensional data**	Lisa McShane, Joerg Rahnenfuehrer

We have eleven panels

Panel		Chairs and Co-Chairs	
MP	**Membership**	Chairs:	James Carpenter, Willi Sauerbrei
PP	**Publications**	Chairs:	Bianca De Stavola, Pam Shaw
		Co-Chairs:	Mitchell Gail, Petra Macaskill
GP	**Glossary**	Chairs:	Simon Day, Marianne Huebner, Jim Slattery
WP	**Website**	Chairs:	Joerg Rahnenfuehrer, Willi Sauerbrei
RP	**Literature Review**	Chairs:	Gary Collins, Carl Moons
BP	**Bibliography**	Chairs:	to be determined
SP	**Simulation Studies**	Chairs:	Michal Abrahamowicz, Anne-Laure Boulesteix
DP	**Data Sets**	Chairs:	Saskia Le Cessie, Maarten van Smeden
TP	**Knowledge Translation**	Chairs:	Suzanne Cadarette
		Co-Chairs:	Catherine Quantin
CP	**Contact Organisations**	Chairs:	Willi Sauerbrei
VP	**Visualisation**	Chairs:	Mark Baillie

The *Lancet* Research: Increasing Value, Reducing Waste Series

How should medical science change?

In 2009, we published a Viepoint by Iain Chalmers and Paul Glasziou called "Avoidable waste in the production and reporting of research evidence", which made the extraordinary claim that as much as 85% of research investment was wasted.

Kleinert and Horton 2014

Global medical and public health research involves billions of dollars and millions of people. […] Although this vast enterprise has led to substantial health improvements, many more gains are possible if the waste and inefficiency in the ways that biomedical research is chosen, designed, done, analysed, regulated, managed, disseminated, and reported can be addressed.

Macleod et al. 2014

Aims of the initiative

- **Provide evidence supported guidance** for highly relevant issues in the design and analysis of observational studies
- As the **statistical knowledge** of the analyst **varies** substantially, guidance has to keep this background in mind. **Guidance** has to be provided **at several levels**
- For the **start** we will concentrate on **state-of-the-art** guidance and the necessary evidence
- Help to identify questions requiring much more primary research

The overarching long-term aim is to improve key parts of design and statistical analyses of observational studies in practice

Different levels of statistical knowledge

Level 1: Low statistical knowledge

- Most analyses are done by analysts at that level

Level 2: Experienced statistician

- Methodology perhaps slightly below state of the art, but doable by every experienced analyst

Level 3: Expert in a specific area

- To improve statistical models and to adapt them to complex real problems, researches develop new and more complicated approaches. Advantages and usefulness in practice need to be assessed

Guidance for analysis is needed for many stakeholders (analysts with different levels of knowledge, teachers, reviewers, journalists, ……)

Consumers **Researchers**

First in a Series of Papers for the Biometric Bulletin

STRATOS initiative – Guidance for designing and analyzing observational studies

STRATOS INITIATIVE

Willi Sauerbrei[1], Marianne Huebner[2] , Gary S. Collins[3], Katherine Lee[4], Laurence Freedman[5], Mitchell Gail[6], Els Goetghebeur[7], Joerg Rahnenfuehrer[8] and Michal Abrahamowicz[9] on behalf of the STRATOS initiative.

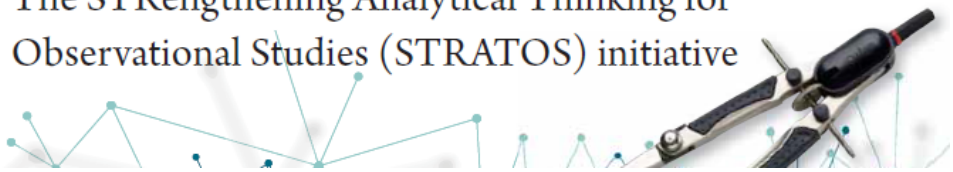
Short papers from

- **TG1** – missing data
- **TG4** – measurement error and misclassification
- **TG3** – initial data analysis
- **TG2** – Variable and function selection
- **TG7** – Causal Inference

have appeared

Guidance for designing and analysing observational studies:

The STRengthening Analytical Thinking for Observational Studies (STRATOS) initiative



Willi Sauerbrei[1], Gary S. Collins[2], Marianne Huebner[3], Stephen D. Walter[4], Suzanne M. Cadarette[5], and Michal Abrahamowicz[6] on behalf of the STRATOS initiative

Volume 26 Number 3 | **Medical Writing** September 2017 | 17

Journal of the European Medical Writers Association (EMWA)

ISCB2019 – STRATOS Program

9.00 - 9.10	Introduction
9.10 - 9.30	TG2 Heinze
9.30 - 9.50	TG3 Le Cessie
9.50 - 10.10	TG7 Goetghebeur
10.10 - 10.30	Visualisation panel, Baillie
11.00 - 11.20	TG8 Therneau
11.20 - 11.40	TG4 Keogh
11.40 - 12.00	TG9 Benner
12.00 - 12.20	Simulation panel, Kipnis
12.20 - 12.30	General discussion