The diffusion of methodological innovation is slow. Valid observational research depends on careful study design, high data quality, appropriate statistical methods and accurate interpretation of results.

### The Problem
- Statistical methods have seen exponential advancements.
- Diffusion of methodological innovation is slow.
- Many developments are not applied in practice.
- Even worse, ‘standard’ analyses reported in the medical literature are often based on unrealistic assumptions or use inappropriate methods, casting doubt on their results and conclusions.
- Analysts, reviewers, editors, readers and many more stakeholders and consumers need guidance for key issues in design and analysis of observational studies.

### Filling the Gap: The STRATOS Initiative
- The STRengthening Analytical Thinking for Observational Studies (STRATOS) initiative was launched in August 2013.
- In November 2019: ~100 researchers from 18 countries worldwide with background in biostatistical and epidemiological methods.
- Connected with leading international organisations, e.g., International Society of Clinical Biostatistics (ISCB), and International Biometric Society (IBS).
- Website includes member details, publications & resources: http://www.stratos-initiative.org/

### STRATOS Objectives
- Provide accessible and evidence-based guidance for key topics in the design and analysis of observational studies.
- Guidance is intended for applied statisticians and other data analysts with varying levels of statistical education, experience and interests.

### Organisational Structure
STRATOS is led by an Executive Committee and a Steering Group. It has the following topic groups and cross-cutting panels:

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<th>Topic Groups (TGs)</th>
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<td>2. Selection of variables and functional forms in multivariable analysis</td>
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### Membership
- **Regular:** Experienced researchers who contribute regularly to STRATOS TG +/− panel activities.
- **Experienced Adjunct:** Experienced researchers who contribute occasionally to STRATOS activities.
- **Early Career Adjunct:** Researchers at early career stages who participate in TG +/− panel activities.
- **Clinical Affiliate:** Clinicians engaged in research with interest and practical experience with statistics.

### Framework for Guidance Development
- **Guidance is aimed at users with three levels of statistical knowledge:**
  - **Level 1:** Low statistical knowledge
    - Propose acceptable methods that are easily implemented.
    - Highlight weaknesses of common approaches.
  - **Level 2:** Experienced statistician
    - Refer to advantages and disadvantages of competing approaches.
    - Propose advanced methodology feasible by experienced analysts.
  - **Level 3:** Expert in a specific area
    - Consider recent developments with statements about possible advantages and disadvantages.
    - Identify areas needing more methodological research or guidance.

### Stages in Guidance Development
- **Phase I:** Experts need to work on state-of-the-art methods and develop guidance for knowledge level 2. Comparisons (simulations) required!
- **Phase II:** Extend guidance to level 1 (simpler methods but still acceptable) and experts work on improved methodology aiming to improve level 2 guidance.

### Activities & Selected Publications
- **Important Meetings/Mini-Symposia**
  - Banff International Research Station, Canada (general meetings in 2016, 2019).
- **Selected Publications**
  - Series of short papers from the TGs in the Biometric Bulletin of IBS (available on the STRATOS website) provide an overview of TG activities.