

Atelier de formation INSERM #209

“Avancées statistiques récentes en analyse causale”

“Recent advances in statistics for causal analysis”

Welcome!

7-8 juin 2011

Invited speakers and INSERM staff

- First, we would like to thank our invited speakers:
 - Basile Chaix, from Villejuif, France
 - Daniel Commenges, from Bordeaux, France
 - Vanessa Didelez, from Bristol, England
 - Isabelle Drouet, from Paris, France
 - Nicholas Jewell, from Berkeley, USA
 - Pierre Neuvial, from Evry, France
 - Michael Rosenblum, from Baltimore, USA
 - Mark van der Laan, from Berkeley, USA
 - Stijn Vansteelandt, from Ghent, Belgium

We believe that in this series of 13 talks, we will sketch a rich overview of *how statisticians tackle causality today*.

- Second, we would like to thank INSERM for organizing this 209-th “atelier” (*i.e.*, workshop), and especially **Raouya Galloub** and **Vanessa Merad** for their diligent and invaluable work.

Why an “atelier” on causality and statistics? (1/2)

Felix qui potuit rerum cognoscere causas !

Heureux celui qui a pu pénétrer les causes secrètes des choses !

Happy is he who can discover the causes of things!

Virgile, *Georgica*

- It is my understanding that *causal questions* are (have been for some time now) at the very heart of a wide class of scientific questions of interest in biology and medicine.
- Yet, I also think that *reaching a causal understanding* of a biological mechanism is generally a *chimera* (even when the mechanism is thought “simple”).
- Nonetheless, being familiar with the *modern tools for causal analysis* proves very fruitful, as it allows to
 - better formulate the problems at stake (for instance, *what do we call a “cause”?!),*
 - better state our working assumptions,
 - better set up our scientific protocols/designs,
 - better understand under what conditions one would reach a causal interpretation.

Why an “atelier” on causality and statistics? (2/2)

Une autre forme d'application très fréquente des mathématiques à la biologie se trouve dans l'usage des *moyennes* ou dans l'emploi de la *statistique* qui, en médecine et en physiologie, conduisent pour ainsi dire nécessairement à l'erreur. (...) Les moyennes (...) doivent donc être repoussées, parce qu'elles *confondent* en voulant réunir et faussent en voulant simplifier.

Using *averages* or resorting to *statistics* is another very frequent example of application of mathematics to biology which, in medicine and physiology, necessarily leads to errors. (...) Averages (...) must be repelled, because they *confound* by trying to gather and distort by trying to simplify.

Claude Bernard, *Introduction à la médecine expérimentale*

- Dear Claude Bernard,
 - because presenting a nice causal model is not a satisfying goal,
 - because all the hard work should at least lead to a meaningful conclusion,

I think on the contrary that *statistics is a key ingredient* for any causal analysis (and that it even goes beyond).

(I also think that a solid biological understanding of the phenomenon of interest is mandatory, even in the case of RCTs. . .)

- This is not about a single method, but rather about *a collection of methodologies*.
- Our invited speakers will present to you some of the most recent advances in statistics with application to causal analysis in a variety of settings.

A few more details

- This is phase I of the “atelier”.
We would like to meet all participants to phase II sometimes today, say after the round-table scheduled from 5:30PM to 6:30PM.
- Nicholas Jewell and Michel Chavance exchanged their time slot.
- Nicholas Jewell, editor of *The International Journal of Biostatistics*, kindly proposed to publish *proceedings* of this “atelier”. Details remain to be discussed. [Stay tuned!](#)

Je laisse la parole à Michel Chavance. . .

Que cet atelier soit fructueux !

May this "atelier" be fruitful!