MEDICINA SOCIAL

REUNIÕES CIENTÍFICAS DO DEPARTAMENTO DE MEDICINA SOCIAL DA FMRP – USP

21/06/2017

PORQUE A REPRESENTATIVIDADE DEVERIA SER EVITADA

Jair Licio Ferreira Santos

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International Journal of Epidemiology 2013;**42**:1012–1014
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POINT COUNTERPOINT

Why representativeness should be avoided

Kenneth J Rothman,[1,2] John EJ Gallacher[3] and Elizabeth E Hatch[1]

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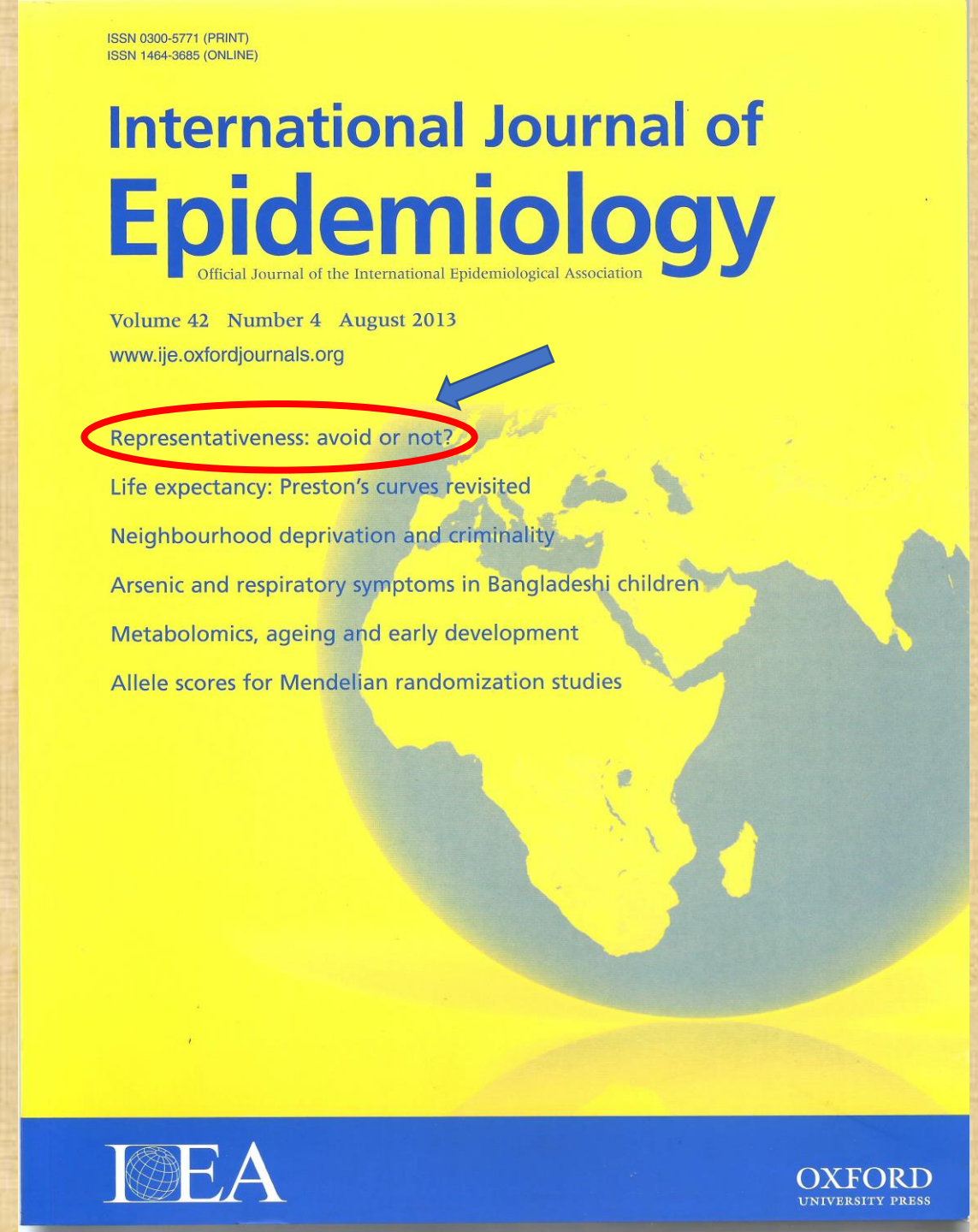
PONTO E CONTRAPONTO É UMA SEÇÃO DA REVISTA QUE NEM SEMPRE É PUBLICADA: DEPENDE, DIGAMOS, DE CIRCUNSTÂNCIA E MOTIVAÇÃO. NESTE CASO, APARENTEMENTE O AUTOR PRINCIPAL HAVIA ESCRITO AOS EDITORES SOBRE O ASSUNTO (TALVEZ COMO UMA “CARTA AO EDITOR”) E ESTES O CONVIDARAM PARA PUBLICAR DESTA FORMA, ASSIM COMO OS AUTORES DAS DEMAIS OPINIÕES SOBRE O ASSUNTO

CHAMADA DE CAPA PARA A SEÇÃO



INTERESSANTE SE PERGUNTAR PORQUE UMA REVISTA COM ESSE IMPACTO RESOLVE SE DEDICAR A UM TEMA, DIGAMOS, SINGELO. AFINAL, KISH JÁ FALAVA SOBRE ISSO NOS ANOS 50 DO SÉCULO PASSADO.

AQUI A ORIGEM: UMA MUDANÇA NO PLANO AMOSTRAL E NO PROJETO DE UMA GRANDE PESQUISA QUE JÁ ESTAVA EM CURSO NOS ESTADOS UNIDOS.

NATURE | SEVEN DAYS

Seven days: 16–22 March 2012

The week in science: Neutrinos don't travel faster than light; China cracks down on research misconduct; and protest over Spanish science cuts.

21 March 2012

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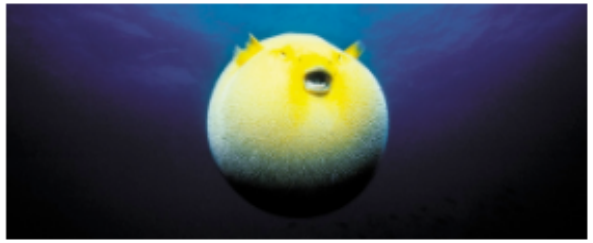
Research | Events | Business | Policy | Trend watch | Coming up

Children's study row Two advisers to the US National Children's Study — which aims to track environmental influences on the health of 100,000 children — have resigned in less than a fortnight. Ellen Silbergeld, an environmental scientist at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, resigned on 5 March, followed on 16 March by biostatistician Jonas Ellenberg of the University of Pennsylvania's Perelman School of Medicine in Philadelphia. They and other scientists are complaining about an abrupt change in sampling design, in which the study will recruit subjects from the offices of physicians rather than taking a representative sample of the US population. See go.nature.com/wb9sh8 for more.

Life beyond species



Biodiversity moves beyond counting species

Ecologists are increasingly looking at how richness of traits — rather than number of species — helps

Detection made from another black-hole merger — but physicists are now keen to see such waves from different types of event.

Farewell, Paris

Health & Research
A-Z Topics
Clinical Trials & Clinical Research
Health Education Programs
NICHD Publications
Data Sharing and Other Resources
Research

- The Human Placenta Project
- The National Children's Study
  - For Researchers
  - For Participants
- Research at NICHD
- Research Supported by NICHD
- NICHD-Supported Research Networks & Programs

National Children's Study (NCS)

Share this:

The NCS was a planned large-scale, long-term study of U.S. children and their parents designed to study environmental influences on child health and development. It was authorized by the Children's Health Act of 2000.

The NCS Vanguard (Pilot) Study began in 2009, testing methods and procedures planned for use in a larger Main Study. When recruitment ended in July 2013, the Vanguard Study had enrolled approximately 5,000 children in 40 locations across the country.

The planned NCS Main Study would have followed 100,000 children from before birth to age 21. However, the NIH Director decided to close the NCS on December 12, 2014, following the advice of an expert review group.

Please refer to the National Children's Study Archive: Study Description and Guide (PDF - 1.4 MB) for a more detailed summary of the scientific basis and operations of the NCS Vanguard Study.

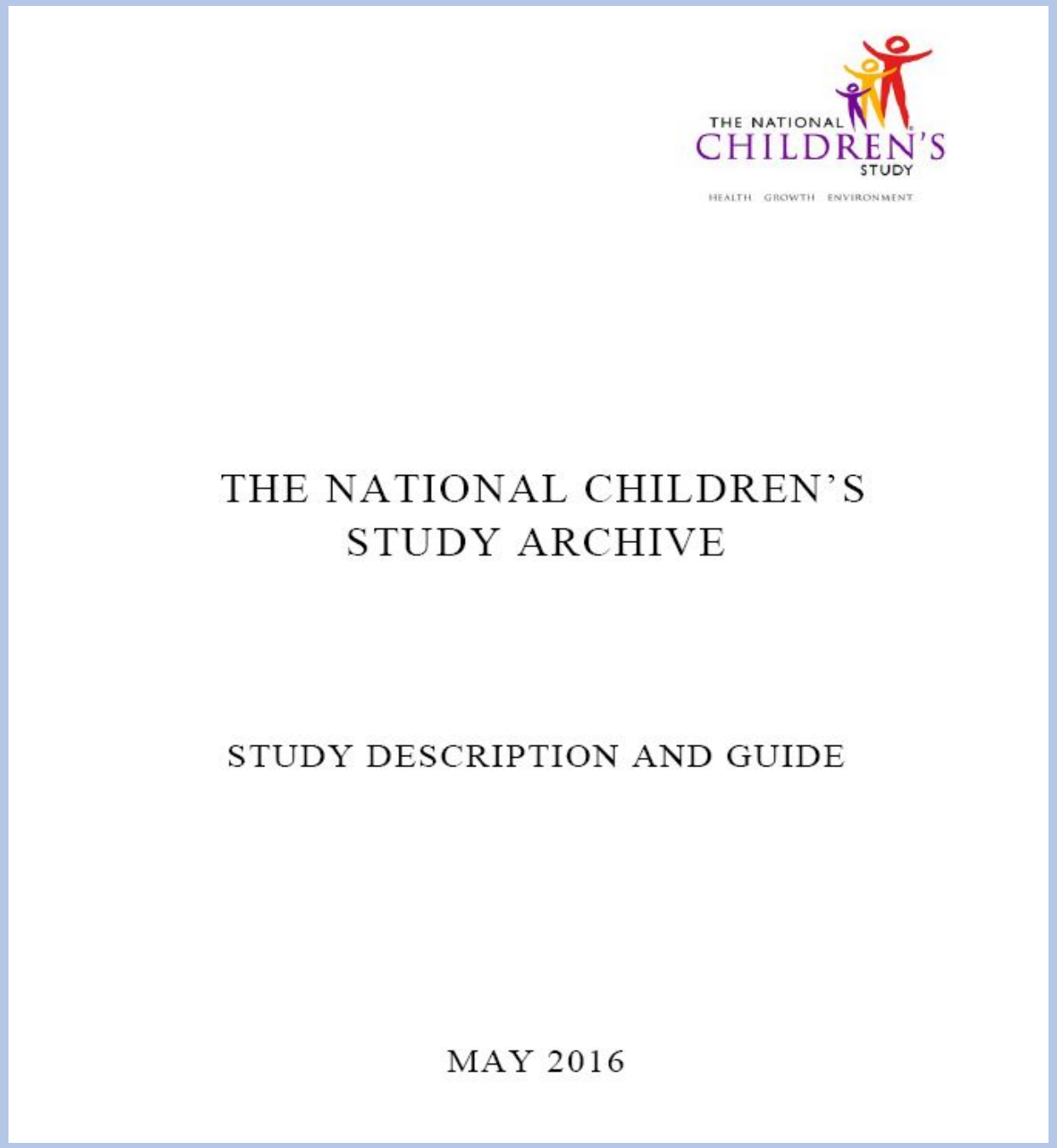
Researchers:

- NCS Vanguard Data and Sample Archive and Access System (NCS Archive)
  - About the NCS Archive
  - Vanguard Study overview
  - Available data
  - Register for access
  - Data Request Quick Guide (PDF - 563 KB)
  - Study Description (PDF - 1.4 MB)
  - Types of material on the NCS Archive
- NCS publications

Participants:

Find answers to your questions

https://www.nichd.nih.gov/research/NCS/Pages/default.aspx



1 Introduction and Overview

The National Children's Study (NCS or Study) was conceived to be a nationally representative longitudinal cohort study of 100,000 children from before birth through age 21. The goal of the NCS was to collect information that ultimately would lead to improvements in the health, development, and well-being of children. The primary aim of the NCS was to investigate the effects of environmental exposures (chemical, biological, physical, and psychosocial) as well as gene-environment interactions on pregnancy outcomes, child health and development, and precursors of adult disease.

Disponível em:
https://www.nichd.nih.gov/research/NCS/Pages/default.aspx

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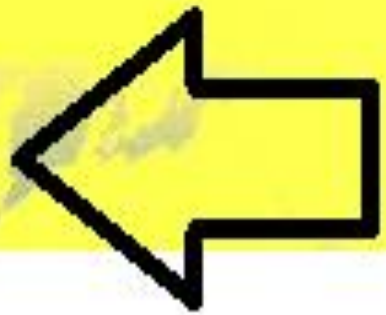
Representativeness: avoid or not?



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Commentary: On representativeness

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Commentary: Epidemiologists have debated representativeness for more than 40 years—has the time come to move on?

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Commentary: Representativeness is usually not necessary and often should be avoided

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Commentary: Should we always deliberately be non-representative?

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Rebuttal: When it comes to scientific inference, sometimes a cigar is just a cigar

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INTRODUÇÃO

Why do so many believe that selecting representative study populations is a fundamental research aim for scientific studies? This view is widely held: representativeness is exalted along with motherhood, apple pie and ***statistical significance.***

Here we suggest that representativeness may be essential for conducting opinion polls, or for public-health applications, but it is ***not a reasonable aim for a scientific study***.

REPRESENTATIVIDADE X OBJETIVOS DA PESQUISA

Within most scientific disciplines, sampling representativeness is incongruous with research goals.

EXEMPLO: Immunologists doing experiments with hamsters do not dwell on getting a representative sample of hamsters. To the contrary, they select hamsters that are extremely unrepresentative because they are homogeneous, having identical genes, living in identical circumstances, and fed identical diets.

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MAIS EXEMPLOS…

…when John Snow conducted his natural experiment showing that London citizens imbibing diluted sewage were at much greater risk of cholera than those consuming water piped from upriver, he was not looking for a representative sample of London citizens. Instead he was looking for people whose characteristics and living conditions were comparable except for the source of their water consumption.

When Doll and Hill studied the mortality of male British physicians in relation to their smoking habits, their findings about smoking and health were considered broadly applicable despite the fact that their study population was unrepresentative of the general population of tobacco users with regard to sex, race, ethnicity, social class, nationality and many other variables.

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INFERÊNCIA CIENTÍFICA X INFERÊNCIA ESTATÍSTICA

Scientific generalization relates to the elaboration of the circumstances in which a finding applies.

It is *not representativeness* of the study subjects that enhances the generalization, it is knowledge of specific conditions and an understanding of mechanism that makes for a proper generalization.

Indeed, representativeness can be *counterproductive:*

For example, to study how an effect varies by ethnic group or socioeconomic category, it would be preferable to choose equal numbers from the different groups, rather than select subjects in proportion to their numbers in the source population.

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Então...nunca usar?

Representative sampling is needed to implement some study designs, such as *control sampling from the source population in some case-control studies*, but that sampling concern about controls is not the same as the representativeness of the study population itself.

Seeking representativeness of the study population makes sense when sampling ***purely for descriptive*** purpose.

Similarly, public-health professionals may rely on representative samples to describe the health status of specific populations.

Mas...há uma diferença:

Surveys of opinions, of the prevalence of disease, of habits or of environmental exposures may be informative, but they are not science in the same way that causal studies about how nature operates are science.

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CONCLUINDO...

Paradoxical though it may seem, statistical representativeness leads to ***particular statements*** about the world, not ***general statements about nature***. As initial steps, surveys may help to seed hypotheses and give a push toward scientific understanding, but the main road to general statements on nature is through studies that control skillfully for confounding variables and thereby advance our understanding of causal mechanisms. ***Representative sampling does not take us down that road***.

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Commentary: On representativeness

J Mark Elwood

VALIDADE INTERNA X VALIDADE EXTERNA

Internal validity is the quality controlling whether a valid assessment of cause and effect can be made within the context of the study. External validity relates to the generalizability or application of this cause and effect assessment to other populations...

VALIDADE INTERNA X INFERÊNCIA

...With high internal validity, the valid assessment of the causal relationship may be widely generalizable, and does not require that the participants be representative of those to whom the new evidence will be applied.

CONCLUSÃO

Both in the planning of studies and in their assessment, a clear understanding of the objectives and therefore the key issues of study design is vital. Rothman et al.'s contribution gives a valuable viewpoint on this.

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J Mark Elwood

Commentary: Epidemiologists have debated representativeness for more than 40 years— has the time come to move on?

Ellen A Nohr and Jørn Olsen

Nota: ambos os autores participam do Danish National Birth Cohort

QUEM ESTÁ PREOCUPADO?

As Rothman et al. rightly note, most scientists are not concerned about representativeness. To that group, one may add epidemiologists doing randomized trials. They often apply strict inclusion criteria in order to maximize compliance to the protocol at the expense of representativeness.

PITO AOS CONSULTORES DA AMOSTRAGEM?

The National Children Study illustrates that this discussion is not only of internal academic interest but has serious consequences, especially for the cost of running such a cohort. Giving advice on design issues is a risky matter that requires much more than theoretical knowledge on sampling theories.

Commentary: Epidemiologists have debated representativeness for more than 40 years— has the time come to move on?
Ellen A Nohr and Jørn Olsen

Commentary: Representativeness is usually not necessary and often should be avoided.
Lorenzo Richiardi, Costanza Pizzi and Neil Pearce.

REPRESENTATIVIDADE NÃO É NECESSÁRIA

…we agree with Rothman and colleagues that scientific inference does not require representativeness, and often explicitly requires that study samples should not be representative.

Overall, representativeness can be harmful or beneficial depending on the study question and context.

MAS NÃO É PARA SER SEMPRE EVITADA…

…further work is needed to fully understand some specific situations, in particular when an ***intermediate variable directly affects baseline selection***. However, leaving aside this specific issue, we consider that the view that studies based on representative samples are clearly better than those based on restricted samples is untenable. Rather, although ***it is perhaps too strong to argue that representativeness should always be avoided,*** it is usually not necessary, and ***often*** should be avoided.

Commentary: Representativeness is usually not necessary and often should be avoided.
Lorenzo Richiardi, Costanza Pizzi and Neil Pearce.

Commentary: Should we always deliberately be non-representative?

Shah Ebrahim and George Davey Smith

SOBRE O ARGUMENTO ENVOLVENDO ENSAIOS RANDOMIZADOS:

Trialists simply do not know (and certainly cannot control for them or generalize from restricted study groups) the complex confounding between age related processes, co-existing disease and therapies, and the effects of a new intervention.

SOBRE O USO DE AMOSTRAS NÃO REPRESENTATIVAS:

Non-representative study groups may produce biased associations: …non-representative cohort generates a potentially spurious result because many factors that are associated with the outcome of interest are also likely to be linked to selection into a study.

CONCLUINDO…

We feel that representativeness should neither be avoided nor uncritically universally adopted, but its value evaluated in each particular setting.

Commentary: Should we always deliberately be non-representative?
Shah Ebrahim and George Davey Smith

Rebuttal:

When it comes to scientific inference, sometimes a cigar is just a cigar

Kenneth J Rothman, John EJ Gallacher and Elizabeth E Hatch

Fortunately, all the writers contributing to this discussion seem to agree on some basics. Even Ebrahim and Davey Smith, despite considerable areas of disagreement, offer a concluding sentence that could easily have characterized our position:

‘We feel that representativeness should neither be avoided nor uncritically universally adopted, but its value evaluated in each particular setting’.

OBSERVAÇÕES QUE NÃO QUEREM CALAR...

"…when John Snow conducted his natural experiment showing that London citizens imbibing diluted sewage were at much greater risk of cholera than those consuming water piped from upriver, he was not looking for a representative sample of London citizens. Instead he was looking for people *whose characteristics and living conditions were comparable except for the source of their water consumption*."

Snow NÃO estava mesmo buscando uma amostra representativa: intencionalmente fazia um censo, tão completo quanto possível, **dos óbitos** que ocorriam em Londres e os relacionava com o consumo de água. Usar este fato como exemplo de que uma amostra representativa é incongruente com os objetivos da pesquisa é alargar demais o passo.

OBSERVAÇÕES QUE NÃO QUEREM CALAR...

"Indeed, representativeness can be *counterproductive:*

For example, to study how an effect varies by ethnic group or socioeconomic category, it would be preferable to choose equal numbers from the different groups, rather than select subjects in proportion to their numbers in the source population."

Notar que aqui há uma confusão de conceitos inaceitável para um profissional com a reputação dos autores: confundiu-se partilha proporcional numa amostra estratificada com representatividade! E, por consequência, ignorou-se a opção - neste caso, mais qualificada – de uma amostra com probabilidades desiguais de seleção em cada estrato.

OBSERVAÇÕES QUE NÃO QUEREM CALAR...

Na verdade, foi essa confusão entre ***Representatividade e Amostragem Estratificada com Partilha Proporcional***, muito frequente entre nossos alunos que levou à leitura desses comentários. Pelo menos os alunos estão em boa companhia!

REPRESENTATIVIDADE: CONSIDERAÇÕES

...in some probability methods every person has an equal probability and in some they have non-equal probability: all that is necessary to ensure *representativeness* of the population is that ***it is a known probability and that no one is left out.***

(AAPOR – disponível em http://www.aapor.org/Education-Resources/For-Researchers/Poll-Survey-FAQ/Why-Sampling-Works.aspx)

REPRESENTATIVIDADE: CONSIDERAÇÕES

É bom especificar qualitativamente para uma assimilição facilitada:

O que se entende por “ninguém ficar de fora” ?

1 –todas as variáveis de interesse para o estudo estão presentes na amostra.

2 - o número de unidades amostrais para cada uma destas variáveis é capaz de produzir estimativas adequadas de sua variabilidade.

REPRESENTATIVIDADE: CONCEITOS MAIS RECENTES

Representativeness refers to the probability that a sample will give the same results as the total population. As noted by Groves and Lyberg (2010), representativeness includes both a variance component that gives the scatter in the measurements on repeated trials and a bias component that refers to the systematic deviation of a cluster of sample measurements from the true population value.

FAN D P. Reconceptualizing Survey Representativeness for Evaluating and Using Nonprobability Samples. ***Survey Practice.*** Vol. 6, no 2, 2013 | www.surveypractice.org

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