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Observational Health Services Studies Using Nationwide Administrative Datasets: Understanding Strengths and Limitations of the National Hospital Ambulatory Medical Care Survey (NHAMCS)

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DISCUSSION POINTS

The National Hospital Ambulatory Medical Survey (NHAMCS) is an annual, federally funded survey of a national representative, multistage, stratified sample of hospital visits, including ED visits, in the United States. Data are collected in real-time by local hospital staff or by a Census Bureau field representative. In light of multiple recent high-profile articles published based on publicly available NHAMCS data, we revisit observational study design, with a particular emphasis on the use of large, publicly available data such as NHAMCS. In this journal club exercise, we use two recent publications to help guide the discussion: Pitts et al., “National Trends in Emergency Department Occupancy, 2001 to 2008: Effect of Inpatient Admissions Versus Emergency Department Practice Intensity” and McCaig et al., “Understanding and Interpreting the National Hospital Ambulatory Medical Care Survey: Key Questions and Answers.”

1A (NOV). Review the general steps of the scientific method. Discuss at least 2 goals that Pitts et al.¹ report as motivation for conducting this study. What are the primary hypothesis(es)? If you think there is more than one primary hypothesis in this study, comment on whether a study should have more than 1 primary hypothesis. What was the study design?

1B. (NOV) Review the concepts of exposure variable, outcome variable, and

1C: (NOV) What are the primary exposure(s) and outcome for each hypothesis?

Editor’s Note: You are reading the 33rd installment of Annals of Emergency Medicine Journal Club. This Journal Club refers to the Pitts et al and McCaig et al articles published in the December 2012 edition.[1, 2] This bimonthly feature seeks to improve the critical appraisal skills of emergency physicians and other interested readers through a guided critique of actual Annals of Emergency Medicine articles. Each Journal Club will pose questions that encourage readers—be they clinicians, academics, residents, or medical students—to critically appraise the literature. During a 2- to 3-year cycle, we plan to ask questions that cover the main topics in research methodology and critical appraisal of the literature. To do this, we will select articles that use a variety of study designs and analytic techniques. These may or may not be the most clinically important articles in a specific issue, but they are articles that serve the mission of covering the clinical epidemiology curriculum. Journal Club entries are published in 2 phases. In the first phase, a list of questions about the article is published in the issue in which the article appears. Questions are rated “novice,” () “intermediate,” (), and “advanced” () so that individuals planning a journal club can assign the right question to the right student. The answers to this journal club will be published in the October 2013 issue. US residency directors will have immediate access to the answers through the Council of Emergency Medicine Residency Directors Share Point Web site. International residency directors can gain access to the questions by going to <http://www.emergencymedicine.ucla.edu/annalsjc/> and following the directions. Thus, if a program conducts its journal club within 5 months of the publication of the questions, no one will have access to the published answers except the residency director. The purpose of delaying the publication of the answers is to promote discussion and critical review of the literature by residents and medical students and discourage regurgitation of the published answers. It is our hope that the Journal Club will broaden Annals of Emergency Medicine’s appeal to residents and medical students. We are interested in receiving feedback about this feature. Please e-mail journalclub@acep.org with your comments.

1D: (INT) What confounders are included in the models? Why might variables be included in an analysis even though they do not meet the definition of a confounder?

2. In Materials and Methods, the authors note that they used aggregate data to construct the independent (exposure) and dependent (outcome) variables.

2A: (NOV) What are aggregate data?

2B: (INT) Compare and contrast individual level data and aggregate level data.

2C: (ADV) What assumptions are being made when using aggregate data to approximate individual data? Give an example of how using aggregate data rather than individual level data might change how one would interpret study results.

2D: (ADV) Describe the concept of ecological fallacy. How might it impact the interpretation of data from NHAMCS to reflect the behavior of individual ED patients?

3A: (INT) How are the data combined across multiple years?

3B: (INT) Describe 2 potential concerns when combining variables across multiple years.

4. NHAMCS is a publicly available dataset available on the CDC's website (http://www.cdc.gov/nchs/ahcd/ahcd_questionnaires.htm). McCaig et al² note that a restricted NHAMCS data set is available for a fee.

4A: (NOV) Where is information regarding the restricted NHAMCS dataset located?

4B: (NOV) What additional variables are included in the NHAMCS restricted dataset?

4C: (INT) Discuss 2 hypotheses you might explore using the restricted NHAMCS dataset that may not be feasible using the publicly available dataset.

5. The systematic sampling of a national population is the great strength of NHAMCS. The quality of the data abstraction processes has been called to question, however. [3] EDs often have different processes for patient flow and admission; some EDs have observation units, some use alternative locations for patient evaluations, and there is variability in when the transfer of care from the ED to the hospital team occurs. Different NHAMCS study sites might not use uniform definitions for these variables. For example, one center might classify a patient with chest pain admitted to an ED observation unit disposition as an admission while another site might classify an identical patient as an ED treat-and-release with a long length of stay.

5A: (INT) Discuss how these different classifications might impact investigations of ED management metrics (eg, time to disposition, resource utilization and ED length of stay). How might these differences in NHAMCS variable classification be addressed?

5B: (INT) Assuming unlimited access to time, money, and resources, what study design(s) might you consider to explore the degree to which ED boarding and intensity of care contribute to ED crowding? Is a randomized, controlled trial a viable option?

5C: (ADV) What other variables would you like to include in the NHAMCS dataset in order to explore the question of whether boarding and intensity of care are associated with or are causal factors in ED crowding?

References

1. Pitts, et al. National Trends in Emergency Department Occupancy, 2001 to 2008: Effect of Inpatient Admissions Versus Emergency Department Practice Intensity. *Ann Emerg Med.* 2012; 60:679–686. [PubMed: 22727201]

2. McCaig, et al. Understanding and Interpreting the National Hospital Ambulatory Medical Care Survey: Key Questions and Answers. *Ann Emerg Med.* 2012; 60:716–721. [PubMed: 23083968]
3. Cooper RJ. NHAMCS: Does It Hold Up to Scrutiny? *Ann Emerg Med.* 2012; 60:722–725. [PubMed: 23178018]