



**Figure.** Histogram representing the obesity variable after 12 500 Markov chain Monte Carlo iterations using the Metropolis-Hasting algorithm.

persons aged between 18 and 64 years in their sample was 19.78%. If Bayesian statistics were used, it would then take these data as existing information to subsequently obtain deeper knowledge by calculating the credible interval.

In this approach, for example, if one takes a beta distribution as the *a priori* probability of obesity (1 898.7700),<sup>4</sup> with the variable obesity and a Bernoulli distribution, and if one then adds the data obtained by Aranceta-Bartrina et al.,<sup>1</sup> after 12 500 iterations and a burn-in period of 2500, one would obtain an *a posteriori* obesity prevalence of 20.1% with a 95% credible interval of 19.4% to 20.8%. That is, this time there would indeed be a 95% probability that the overall prevalence of obesity in Spain is between 19.4% and 20.8%. The **Figure** shows a histogram representing the distribution of obesity according to Markov chain Monte Carlo simulations.

This coincides almost exactly with the confidence interval provided by Aranceta-Bartrina et al.<sup>1</sup> (19%-24.2%), because when studies are similar in design, the confidence interval and the credible interval tend to be similar,<sup>2</sup> although this is not necessarily the case. If Bayesian statistics are not used, there are 2 options: pay attention to only 1 of the studies and ignore the

other (even if the methodology of both is appropriate) or conduct a third study that generates more evidence and acts as a “tie breaker”, even in the knowledge that it will not answer the original question.

Daniel Hernández-Vaquero,<sup>a,\*</sup> Rocío Díaz,<sup>a</sup> Jacobo Silva,<sup>a</sup> and César Morís<sup>ab</sup>

<sup>a</sup>Área del Corazón, Hospital Universitario Central de Asturias, Oviedo, Asturias, Spain

<sup>b</sup>Departamento de Medicina, Universidad de Oviedo, Oviedo, Asturias, Spain

\* Corresponding author:

E-mail address: [dhvaquero@gmail.com](mailto:dhvaquero@gmail.com) (D. Hernández-Vaquero).

Available online 28 October 2016

## REFERENCES

1. Aranceta-Bartrina J, Pérez-Rodrigo C, Alberdi-Aresti G, Ramos-Carrera N, Lázaro-Masedo S. Prevalence of general obesity and abdominal obesity in the Spanish adult population (aged 25–64 years) 2014–2015: The ENPE study. *Rev Esp Cardiol.* 2016;69:579–87.
2. Thompson J. The problem of priors. In: Thompson J, editor. *Bayesian analysis with STATA*. Texas: Stata Press; 2014. p. 1–8.
3. Gandhi M, Mukherjee B, Biswas D. A Bayesian approach for inference from a bridging study with binary outcomes. *J Biopharm Stat.* 2012;22:935–51.
4. Gutiérrez-Fisac JL, Guallar-Castillón P, León-Muñoz LM, Graciani A, Banegas JR, Rodríguez-Artalejo F. Prevalence of general and abdominal obesity in the adult population of Spain, 2008–2010: the ENRICA study. *Obes Rev.* 2012;13:388–92.

## SEE RELATED ARTICLES:

<http://dx.doi.org/10.1016/j.rec.2016.09.029>

<http://dx.doi.org/10.1016/j.rec.2016.02.009>

<http://dx.doi.org/10.1016/j.rec.2016.08.015>

1885–5857/

© 2016 Sociedad Española de Cardiología. Published by Elsevier España, S.L.U. All rights reserved.

## Why Not Use Existing Knowledge: Bayesian Statistics. Response



### Por qué no utilizar el conocimiento previo: la estadística bayesiana. Respuesta

#### To the Editor,

We would like to thank Hernández-Vaquero et al. for their interest and comments on our study.<sup>1</sup> We agree that a Bayesian approach could enhance the analysis of data from the ENPE study (Spanish acronym for the Nutritional Study of the Spanish Population), and we will consider this for future publications. The debate on Bayesian vs frequentist methods has been open for some time.<sup>2,3</sup>

We used frequentist inference to analyze data collected from a random probability sample ( $n = 3966$ ), with a careful methodological protocol and quality controls. All the studies we used as reference and context, conducted in Spain and other countries,

used this approach. Hernández-Vaquero et al. state that their Bayesian estimate coincides almost exactly with our frequentist estimate, which often happens when the studies are of similar design and the sample size is large.

We share the view of many other authors, that neither approach is superior: each has its advantages and limitations. It is true that interest in Bayesian methods is increasing, as reflected in the changes in the number of publications retrieved when searching the term “Bayesian” in PubMed.<sup>4</sup> In studies from the last 6 years (2010–2015), 16 665 publications include “Bayesian” in the title or abstract, and 81 321 include “obesity”, but only 71 records contain both “Bayesian” and “obesity”. Most epidemiological research has been done (and continues to be done) using a frequentist approach, without jeopardizing the knowledge acquired. Many authors use both approaches, depending on the research question, the study design, the size and design of the sample, the type of data, etc.<sup>5</sup> We advocate a pragmatic approach, based on reasoning, reflection, and contextualization of the data.

## FUNDING

The ENPE study was funded by the *Fundación Eroski* via an agreement with SPRIM and the Spanish Society of Community Nutrition (SENC). The sponsor was not involved in the study design, data collection, analysis or interpretation of results, drafting of the manuscript, or the decision to publish the results.

## CONFLICTS OF INTEREST

S. Lázaro-Masedo and N. Ramos-Carrera are linked to SPRIM, who carried out consulting activities for the *Fundación Eroski*.

Javier Aranceta-Bartrina,<sup>a,b,c,d,\*</sup> Carmen Pérez-Rodrigo,<sup>b,c</sup> Natalia Ramos-Carrera,<sup>e</sup> and Sonia Lázaro-Masedo<sup>e</sup>

<sup>a</sup>Medicina Preventiva y Salud Pública, Facultad de Farmacia, Universidad de Navarra, Pamplona, Navarra, Spain

<sup>b</sup>Sociedad Española de Nutrición Comunitaria (SENC), Barcelona, Spain

<sup>c</sup>Fundación FIDEC, Euskal Herriko Unibertsitatea-Universidad del País Vasco, Basurto-Bilbao, Vizcaya, Spain

<sup>d</sup>CiberOBN, Instituto de Salud Carlos III, Madrid, Spain

<sup>e</sup>SPRIM-España, Madrid, Spain

\*Corresponding author:

E-mail addresses: [jaranceta@unav.es](mailto:jaranceta@unav.es), [javieraranceta@gmail.com](mailto:javieraranceta@gmail.com) (J. Aranceta-Bartrina).

Available online 4 November 2016

## REFERENCES

1. Aranceta-Bartrina J, Pérez-Rodrigo C, Alberdi-Aresti G, Ramos-Carrera N, Lázaro-Masedo S. Prevalencia de obesidad general y obesidad abdominal en la población adulta española (25-64 años) 2014-2015: estudio ENPE. *Rev Esp Cardiol*. 2016; 69:579–87.
2. Silva LC, Muñoz A. Debate sobre métodos frecuentistas vs bayesianos. *Gac Sanit*. 2000;14:482–94.
3. Greenland S. Bayesian perspectives for epidemiological research: I. Foundations and basic methods. *Int J Epidemiol*. 2006;35:765–75.
4. Zangiacomi-Martinez E, Alberto-Achcar J. Trends in epidemiology in the 21st century: time to adopt Bayesian methods. *Cad Saude Publica*. 2014;30:703–14.
5. Seliske L, Norwood TA, McLaughlin JR, Wang S, Palleschi C, Holowaty E. Estimating micro area behavioural risk factor prevalence from large population based surveys: a full Bayesian approach. *BMC Public Health*. 2016;16:478.

SEE RELATED ARTICLE:

<http://dx.doi.org/10.1016/j.rec.2016.08.015>

<http://dx.doi.org/10.1016/j.rec.2016.09.029>

1885-5857/

© 2016 Sociedad Española de Cardiología. Published by Elsevier España, S.L.U. All rights reserved.

## Does Implementation of the Infarction Code Lead to Changes in the Treatment and Prognosis of Patients With Non-ST Elevation Acute Coronary Syndrome?



### ¿La implantación del código infarto implica cambios en el tratamiento y el pronóstico de los pacientes con síndrome coronario agudo sin elevación del ST?

To the Editor,

We read with interest the article by Cordero et al.,<sup>1</sup> which analyzed the effects of implementing an infarction code program on the treatment and prognosis of patients with acute coronary syndrome.

Firstly, we would like to congratulate the authors for the elegant description of the benefits that such programs have on the management of ST-elevation acute coronary syndrome (STEACS). They achieved outstanding results, with the rate of primary angioplasty in STEACS patients increasing from 51.9% to 94.9% in their hospital.

We would also like to point out that the implementation of such networked care systems for the emergency management of STEACS could have led to NSTEMI patients being pushed into the background, even though these patients form the majority of acute coronary syndrome patients admitted to our hospitals.<sup>2</sup> We would like to further congratulate the authors for the inclusion of these patients in their study. We agree that, although theoretically the main objective when implementing an infarction code program is to improve STEACS management by facilitating access to primary angioplasty, as this study demonstrates, implementing standardized protocols and care networks can also improve NSTEMI management. However, we would like to make some comments we feel are pertinent.

The benefits of implementing an infarction code for patients with STEACS have already been described; therefore, the most

interesting part of this study is, in our opinion, the analysis of the changes in treatment and prognosis for patients with NSTEMI. From the authors' description, it appears that implementation of the code had no significant effect on the NSTEMI subgroup. In fact, it appears that the reductions in hospital stay and intensive care stay and the increased revascularization rate in the first 48 hours correspond only to patients with STEACS; in patients with NSTEMI there were no differences in the time to revascularization or in revascularization rate.<sup>1</sup> Although these variables were unchanged for the group of all NSTEMI patients, there may have been some differences in high-risk NSTEMI patients, who require early invasive treatment<sup>2</sup> and therefore should benefit more from the implementation of such a protocol. If such differences were present, this could partly explain the reduction in overall mortality in high-risk acute coronary syndrome patients. It would be interesting to know how many patients with NSTEMI were considered high risk according to current clinical practice guidelines,<sup>2</sup> and if implementation of the program led to an increase in the percentage of these patients receiving coronary angiography and revascularization in the first 24 hours.

If such differences in high-risk NSTEMI patients were not present, the trend seen toward reduced mortality in NSTEMI patients but not in STEACS patients would be remarkable, considering that there was no increase in the early revascularization rate in NSTEMI patients, and that the patient risk profile was higher in the second study period, according to the GRACE score.<sup>1</sup> It would be interesting to know the authors' opinions regarding changes in medical treatment after implementation of the program and other factors that may have played a role in this finding.

Regarding the reduction in mean stay for STEACS patients, we would also like to ask the authors about one of the more contentious organizational aspects of this type of networked care: organizing patients' return transfer to their original referring hospitals after primary angioplasty. It would be interesting to know more details, such as if these patients were ever admitted to the intensive care unit after primary angioplasty and before