

## Informing Youth about the Age of Sexual Initiation Using Means or Percentages

Jokin de Irala, MD, MPH, PhD<sup>1,2</sup>

Alfonso Osorio, PhD<sup>1,3,\*</sup>

Miguel Ruiz-Canela, MPH, PhD<sup>1,4</sup>

Silvia Carlos, PhD<sup>1,2</sup>

Cristina López-del Burgo, MD, PhD<sup>1,2</sup>

<sup>1</sup> Institute for Culture and Society, University of Navarra

<sup>2</sup> Preventive Medicine and Public Health, School of Medicine, University of Navarra

<sup>3</sup> Department of Education, University of Navarra

<sup>4</sup> Department of Biomedical Humanities, University of Navarra

\* Corresponding author

Department of Education, University of Navarra

31080 Pamplona (Spain)

Tel: +34 948425600 ext. 802772 Fax: +34 948425636

[aosorio@unav.es](mailto:aosorio@unav.es)

### Published in:

Health Communication

<http://www.tandfonline.com/eprint/dAmg7SmkzpNzeyArNJyJ/full#.UmeW4xDaGSo>

See original article in the Journal's web page:

<http://www.tandfonline.com/doi/full/10.1080/10410236.2013.775931>

### Cite as:

De Irala J, Osorio A, Ruiz-Canela M, Carlos S, López-del Burgo C. Informing Youth about the Age of Sexual Initiation using Means or Percentages. *Health Communication* 2014 29(6), 629-633.

## **ABSTRACT**

The common statistical indicator “mean age of first sex” can be misinterpreted by youth to indicate that most of their peers of the same age are sexually initiated, when this is not usually the case. This can jeopardize efforts to delay sexual initiation. University students were randomly assigned to one of two versions of an anonymous survey. They were asked to estimate how common sexual initiation was at a given age upon being presented with statements with different wordings, such as the “mean age of first sex” or “proportions of youth at different ages having had sex.” Their interpretations were compared using logistic regression. Students who were assigned surveys using the indicator “mean age” of sexual initiation had higher odds of overestimating the extent of sexual initiation compared to those assigned surveys using percentages as the indicator, even after adjusting for student’s sex and degree. We encourage the use of the “percentage” of youth, at different ages, who are sexually initiated as a more reliable indicator.

**Key Words:** sexual intercourse, sexual initiation, mean age of first sex, adolescence.

## INTRODUCTION

Early age at first sexual intercourse represents a significant threat to health because it is associated with riskier sexual exposures such as having unprotected sex on first sexual intercourse, condom misuse or having multiple partners, concurrently or over a lifetime. (Kaestle, Halpern, Miller, & Ford, 2005; Pettifor, van der Straten, Dunbar, Shiboski, & Padian, 2004). These practices result in higher rates of sexually transmitted infections (STIs), teenage pregnancies and adverse psychological consequences such as feelings of disappointment and regret (Centers for Disease Control and Prevention, 2008; Oswalt, Cameron, & Koob, 2005; Wight, Parkes, Strange, Allen, Bonell, & Henderson, 2008).

Early sexual initiation and the number of lifetime partners are important variables for public health policy makers who intend to prevent unwanted outcomes such as the STI epidemics. Health and educational authorities worldwide are therefore increasing the emphasis on the promotion of the delay of onset of sexual relationships among youth (Halperin et al., 2004). As a result, the Joint United Nations Program on HIV/AIDS (UNAIDS) has introduced changes in its yearly reports on the global AIDS epidemic: in addition to condom use, they now include indicators pertaining to age of sexual initiation and multiple partnerships in different countries as a means of more comprehensively monitoring all the determinants of the epidemic (UNAIDS, 2010).

However, public health recommendations to delay sexual initiation might be more difficult for youth to adopt if they perceive that most of their peers of the same age are already sexually initiated, as some studies suggest (Chia, 2006; Chia & Lee, 2008; Sieving, Eisenberg, Pettingell, & Skay, 2006). This can be the case particularly when information concerning the

typical age of sexual initiation is inadequately conveyed by the media. The ostensible targets of media campaigns, such as the general population and indeed young people themselves, can easily be misled. For example, phrases making use of data related to means, such as this one: “compared with previous generations, young people (16-20-year-olds) were having intercourse for the first time at an earlier age, on average at 16.5 years of age” (Avery & Lazdane, 2008), are not clear as to how many youth in these age groups have in fact had sex. Means lack precision in terms of describing the actual extent of sexual initiation at different ages. A plausible but mistaken (if perhaps common) interpretation of such a statement is that “most youth” aged around 16 are having sex when, in fact, the contrary may well be true.

As we have shown in a brief report using original data collected from an ongoing international study examining what youth think and feel about relationships, love and sexuality (Project YOURLIFE) (de Irala et al., 2009; Osorio, López-del Burgo, Carlos, Ruiz-Canela, Delgado, & de Irala, 2012; Ruiz-Canela, López-del Burgo, Carlos, Calatrava, Osorio, & de Irala, 2012), the use of the indicator “mean age” at first sexual intercourse has the potential to mislead. In particular, the distribution of the mean age of first sexual intercourse tends to be skewed in the context of studies involving youth. Statements relying on such an indicator tend therefore not to be consistent with what many people may conclude: that “most youth close to that age are sexually initiated.” This is because even when most of them are not sexually initiated, the mean is calculated only using ages of those who are already sexually initiated, and thus not taking into account those who will initiate sex at older ages (de Irala, Osorio, Carlos, Ruiz-Canela, & López-del Burgo, 2011).

For example, we have shown that the mean age of first sexual intercourse in countries such as El Salvador, Peru and Spain was approximately 15.2, 14.7 and 16.2 respectively. In all

three countries, however, it must be stressed that the proportion of youth with ages close to those means that were already sexually initiated ranged between 17% and 22%.

These types of epidemiological data can create radically different impressions which in turn may hinder public health and educational interventions designed to delay sexual initiation among youth (Halperin et al., 2004). In fact, as social norms theory has highlighted, the misperception that most peers are involved in risky behavior may influence people to conform their own behavior towards the misperceived norm (Berkowitz, 2005). As a result of these findings we have concluded that using indicators pertaining to the percentages of youth who have already initiated sexual relationships at different ages, rather than those pertaining to the mean age, should be encouraged.

Although our findings in the aforementioned brief report suggested that some attempts to quantify certain aspects of sexual initiation can be misleading, we have not definitively proven that youth indeed misinterpret messages regarding the mean age of sexual initiation. The objective of this paper is to further explore this issue by showing that wrong interpretations of means regarding age of first sexual intercourse are indeed a reality. We intend to evaluate what university students actually understand when they are confronted with data regarding the age of sexual initiation.

## **METHODS**

### *Sample and Data Collection*

Data on sexual initiation from a previous study were presented to a convenience sample of students from a Spanish university under the assumption that they possess greater knowledge of statistics compared to adolescents from the general population. Data were presented to them

using verbiage typically used by the media when they cover such topics. The sample consisted of first year students from the 6-year Degree of Medicine (approximately 18 years of age), third year students from the 3-year Degree of Human Nutrition (approximately 20 years of age) and fifth year students from the 5-year Degree of Pharmacy (approximately 22 years of age).

During in-class lectures on Biostatistics or Public Health, students were invited to participate in a short voluntary and anonymous survey. Students were informed that this was part of a research project conducted by the department of Preventive Medicine and Public Health of the Medical School and that they could leave the survey blank if this was their preference. The only additional information the survey requested was their sex, and they were given a couple of minutes to complete it. No incentives were offered.

Students had to respond to one of the versions of the survey concerning the age of first sexual intercourse. Four versions were distributed, but this paper refers to the data collected with two of those versions, presented in Figures 1 and 2. Versions were randomly distributed to the students (each student received only one version). Version 1 (Figure 1) depicts the proportion of youth, at each age group, that have already had sexual relations. Version 2 (Figure 2) uses the mean age of sexual initiation.

Ethical approval for the original study through which we obtained data on sexual initiation among adolescents was granted by the Ethics Committee of the University of Asia and the Pacific (The Philippines) and by the Ethics Committee of the University of Malaga (Spain). No ethical committee involvement was warranted for the in-class exercise to assess the student's interpretation of such data.

## **ANALYSIS**

Chi-square analyses were performed to confirm the two groups were randomly assigned (each group being the set of participants with the same version of the survey).

The main outcome of interest in this study was the perceived extent of sexual initiation among youth when the participating students encountered the information on sexual initiation (Figures 1 and 2). Data were compared using the Chi Square test for independent samples.

A non-conditional multivariate logistic regression was performed to take into account the differential effect of student's sex, the type of degree being pursued, as well as the information assigned to each student (means or percentages). These variables were independent variables, and choosing answer A ("the graph/news suggests that the majority of 15-year olds have already had sexual relations") was the dependent variable. The clustered sampling (i.e. the fact that samples came from students pursuing three different degrees) was also taken into account in the analysis to derive robust estimations of standard errors. The statistical analyses were performed using STATA version 11.

## **RESULTS**

The sample of students participating in the in-class survey was composed of 89 students from Medicine (64% female, approximate mean age=18), 46 from Human Nutrition (87% female, approximate mean age=20) and 92 from Pharmacy (79% female, approximate mean age=22). They constituted approximately 85%, 82% and 75% of the students that were eligible for the study, respectively. Non-participation was due to either missing class on the particular day the survey was implemented or not having returned the questionnaire to the teacher. Missing class was unrelated to the survey as students were not previously informed that the survey would

take place. In the subsample we are studying here, there were 44 students from Medicine (68% female), 23 from Human Nutrition (91% female) and 46 from Pharmacy (87% female).

There were no significant differences between the groups (each group being the set of participants with the same version of the survey) regarding student's sex or type of degree (data not shown).

Participants' answers are as follows. In both versions (1<sup>st</sup> version, with information framed as percentages; and 2<sup>nd</sup> version, with information framed as means), the answer "the graph/news suggests that the majority of 15-year olds have already had sexual relations" was chosen by a minority of participants, but it was chosen more frequently among those who received information framed as means than among those who received information framed as percentages (27.8% vs. 8.5%,  $p=.007$ ).

Few participants (7.1%) responded "I am not sure" in their corresponding version of the questionnaire, with no difference between those assigned to interpret data framed as means versus those assigned to interpret data framed as percentages (11.1% vs. 3.4%,  $p = .110$ ).

Non-conditional multivariate logistic regression analysis was used, taking into account the clustered sampling and the possible differential effects of certain variables: student's sex, degree type, and whether data was presented in terms of means or percentages. Presenting data in terms of mean age resulted in more subjects choosing answer A ("the graph/news suggests that the majority of 15-year olds have already had sexual relations") compared to data presented in terms of percentages, after adjusting for the other variables (Adjusted OR: 4.77; 95% CI: 1.59-14.29) (Table 1).

## DISCUSSION

The data on sexual activity among youth clearly show that the percentage of sexually initiated teens can be quite low at ages that are close to the mean age of sexual initiation. This therefore suggests that broadly conveyed messages about sexual initiation which use the “mean age” indicator can be misleading. It is, in fact, quite plausible and even likely that data based on the “mean age” indicator may be commonly misinterpreted (de Irala, Osorio, Carlos, Ruiz-Canela, & López-del Burgo, 2011).

In this paper we intended to verify that misunderstanding messages which make use of the “mean age” indicator for sexual initiation was not only a potential problem but actually exists. Results show that short sentences based upon the mean age of sexual initiation, such as those used in headlines by the media, can be associated with a greater perception that 50% or more youth close to that mean age have already had sex. And this perception is not accurate (as we have already shown, percentages of sexual initiation at those ages are usually much lower than 50%). This seems to indicate that the “mean age” indicator is indeed misleading and should thus be avoided when transmitting information related to sexual initiation to the general public. At the very least, it should always be conveyed together with the “percentage” of sexually initiated youth at different ages.

One possible limitation of this study might be related to the fact that the different types of indicators (i.e. mean age and percentages) were not presented in an identical manner. The data presented to the cohort of students in terms of percentages was more detailed and was also visual (instead of verbal). This might explain, in part, the fact that students receiving data framed as mean age were wrong more frequently. However, the graph indicating several percentages may also have distracted youth. A single verbal sentence saying that 22% of 15-year-olds have had

sex (what we suggest media should say) would have produced even fewer errors among youth interpreting percentages.

The ideal sample to work with would have been a sample of teens whose ages are closer to the target population, in this case those from 13 to 18 years of age who could well be misled by media messages relating to the age of sexual initiation. However, we chose a convenience sample of university students for efficiency purposes. The students that participated in our survey had already taken Biostatistics courses. There is absolutely no reason to believe that this sample would have more difficulties in interpreting data compared to teens aged thirteen to eighteen in the general population. The contrary is more likely true. The results we observed could therefore be expected to result in a higher degree of misperception in the younger ages of the general population because, if anything, there could be a bias towards the null in our study. Furthermore, we could not reasonably expect a younger, less educated cohort to make the proper distinctions more often than this sample. In other words, the use of mean age of sexual initiation is likely to be more misleading in the general adolescent population than what it proved to be in our sample.

To our knowledge, this is the first study conducted to examine whether the use of the “mean age” indicator for sexual initiation is indeed misleading, especially when this information is provided without specifying the percentage of youth who are sexually initiated at each age. Our results strikingly confirm prior recommendations to use the percentage of youth, at different ages, who have already initiated sexual relationships instead of using the “mean age” indicator (de Irala, Osorio, Carlos, Ruiz-Canela, & López-del Burgo, 2011). Researchers could be advised to place more emphasis on percentages rather than on mean ages when their results may be picked up by media. Ongoing research on how specific target audiences perceive sensitive health

education messages is necessary in order to avoid misperceptions that could hinder health promotion.

Public health policies that seek to achieve a delay of the age of first sexual intercourse will be more effective if adolescents do not have the false idea that the majority of those their age are sexually initiated when this is in fact not the case. This can be achieved by insisting upon more precise depictions of trends, i.e. using the percentage of youth sexually initiated at different ages instead of the mean age of sexual initiation.

## REFERENCES

- Avery, L., & Lazdane, G. (2008). What do we know about sexual and reproductive health of Adolescents in Europe? *European Journal of Contraception Reproductive Health Care*, 13, 58-70.
- Berkowitz, A. D. (2005). An overview of the social norms approach. In L. C. Lederman, & L. P. Stewart (Eds.), *Changing The Culture Of College Drinking: A Socially Situated Health Communication Campaign* (pp. 193-214). Cresskill, NJ: Hampton Press.
- Centers for Disease Control and Prevention. (2008). *Nationally Representative CDC Study Finds 1 in 4 Teenage Girls Has a Sexually Transmitted Disease*. Retrieved June 29, 2010, from [www.cdc.gov/stdconference/2008/press/release-11march2008.htm](http://www.cdc.gov/stdconference/2008/press/release-11march2008.htm).
- Chia, S. C. (2006). How peers mediate media influence on adolescents' sexual attitudes and sexual behavior. *Journal of Communication*, 56, 585-606.
- Chia, S. C., & Lee, W. P. (2008). Pluralistic ignorance about sex: The direct and the indirect effects of media consumption on college students' misperception of sex-related peer norms. *International Journal of Public Opinion Research*, 20, 52-73.
- de Irala, J., Osorio, A., López-del Burgo, C., Belen, V. A., de Guzman, F. O., Calatrava, M., et al. (2009). Relationships, love and sexuality: what the Filipino teens think and feel. *BMC Public Health*, 9(282).
- de Irala, J., Osorio, A., Carlos, S., Ruiz-Canela, M., & López-del Burgo, C. (2011). Mean Age of First Sex: Do They Know What We Mean? *Archives of Sexual Behavior*, 40, 853-855.
- Halperin, D. T., Steiner, M. J., Cassell, M. M., Green, E. C., Hearst, N., Kirby, D., et al. (2004). The time has come for common ground on preventing sexual transmission of HIV. *Lancet*, 364, 1913-1915.

Kaestle, C. E., Halpern, C. T., Miller, W. C., & Ford, C. A. (2005). Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults. *American Journal of Epidemiology*, *161*, 774-780.

Osorio, A., López-del Burgo, C., Carlos, S., Ruiz-Canela, M., Delgado, M., & de Irala, J. (2012). First Sexual Intercourse and Subsequent Regret in Three Developing Countries. *Journal of Adolescent Health*, *50*, 271-278.

Oswalt, S. B., Cameron, K. A., & Koob, J. J. (2005). Sexual regret in college students. *Archives of Sexual Behavior*, *34*, 663-669.

Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004). Early age of first sex: a risk factor for HIV infection among women in Zimbabwe. *AIDS*, *18*, 1435-1442.

Ruiz-Canela, M., López-del Burgo, C., Carlos, S., Calatrava, M., Osorio, A., & de Irala, J. (2012). Familia, amigos, y otras fuentes de información asociadas al inicio de las relaciones sexuales en adolescentes. *Revista Panamericana de Salud Pública*, *31*, 54-61.

Sieving, R. E., Eisenberg, M. E., Pettingell, S., & Skay, C. (2006). Friends' influence on adolescents' first sexual intercourse. *Perspectives on sexual and reproductive health*, *38*, 13-19.

UNAIDS. (2010). *2010 Report on the global AIDS epidemic*. Retrieved December 15, 2010, from [http://www.unaids.org/globalreport/Global\\_report.htm](http://www.unaids.org/globalreport/Global_report.htm).

Wight, D., Parkes, A., Strange, V., Allen, E., Bonell, C., & Henderson, M. (2008). The Quality of Young People's Heterosexual Relationships: A Longitudinal Analysis of Characteristics Shaping Subjective Experience. *Perspectives on sexual and reproductive health*, *40*, 226-237.

Table 1

*Odds ratios of “overestimation” of the extent of sexual initiation among youth*

	Chose answer A <sup>a</sup> n (%)	p <sup>†</sup>	Odds ratios of choosing answer A <sup>a</sup>	
			OR (95% CI)	Adjusted OR (95% CI) <sup>b</sup>
<b>Information given</b>				
Percent sexually initiated (N=59)	5 (8.5)	.007	(ref)	(ref)
Mean age of first sex (N=54)	15 (27.8)		4.15 (1.83-9.42)	4.77 (1.59-14.29)
<b>Sex</b>				
Female (N=91)	15 (16.5)	.491	(ref)	(ref)
Male (N=22)	5 (22.7)		1.49 (0.58-3.85)	2.37 (0.52-10.68)
<b>Degree</b>				
Medicine (N=44)	6 (13.6)	.357	(ref)	(ref)
Human Nutrition (N=23)	3 (13.0)		0.95 (0.21-4.21)	1.15 (0.80-1.64)
Pharmacy (N= 46)	11 (23.9)		1.99 (0.67-5.95)	2.50 (1.65-3.79)

<sup>a</sup> Answer A was “The graph suggests that the majority of the 15-year olds have had sexual relations” (see Figures 1 and 2).

<sup>b</sup> Odds ratios adjusted for all the variables in the table.

*Figure 1.*

First version of the questionnaire delivered to university students.

Data are on age of sexual initiation from one participating country (El Salvador) of Project YOURLIFE. Each student had to reply to one of these versions that were randomly distributed to them in classroom.

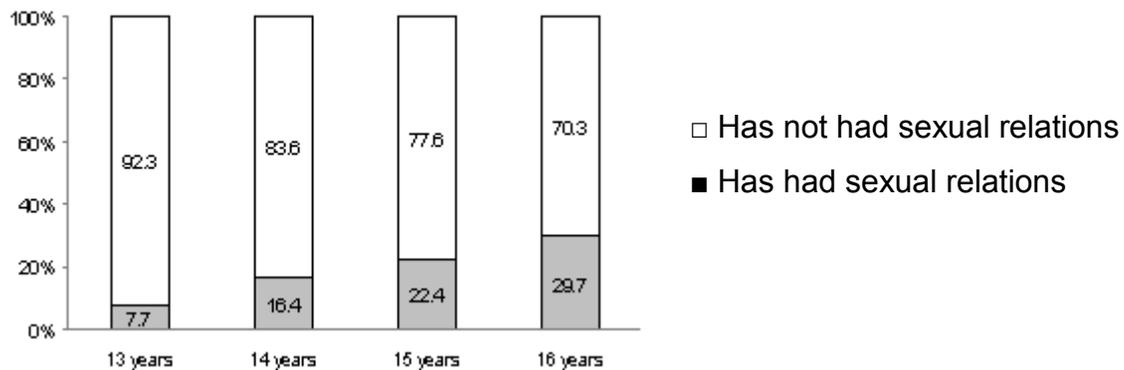
*Figure 2.*

Second version of the questionnaire delivered to university students.

Data are on age of sexual initiation from one participating country (El Salvador) of Project YOURLIFE. Each student had to reply to one of these versions that were randomly distributed to them in classroom.

Figure 1

Observe the following figure and concentrate on the information about the 15-year olds:



What is your understanding of the following statement?

“The graph suggests that the majority of the 15-year olds have had sexual relations”

- (a) It is correct
- (b) It is incorrect
- (c) I am not sure

Figure 2

A local newspaper gives the following news: “The mean age of sexual initiation is 14.8 years old.”

What is your opinion of the following interpretation of this news?

“The news suggests that the majority of 15-year olds have already had sexual relations”

- (a) It is a correct interpretation
- (b) It is an incorrect interpretation
- (c) I am not sure