

Gender income gap among physicians and nurses in Peru: a nationwide assessment

The difference in salary among male and female health professionals has received important attention in the past few years. In the USA, an unadjusted estimation showed that male physicians earn on average 25% more than women.¹ Overall, several studies done in high-income countries have found that male physicians earn around US\$10 000–19 878 more than women yearly.^{1,2} Similarly, within nurse practitioners in the USA, where women represent around 90% of the workforce labour, male nurses earn around \$7000–12 000 more than do female nurses yearly, with trends remaining constant over time.^{3,4}

Similar analyses have not been conducted in low-income and middle-income countries (LMICs). Under-financed and fragmented health-care systems cause salaries of all health-care professionals to be closer to the minimum wage in LMICs⁵ than in high-income countries.⁶ Because the standards of living of health-care professionals are lower in general in LMICs, gender differences in income might have a larger impact on women in these countries.

We did a secondary analysis in Peru using data from the National Survey of Satisfaction of Users of Universal Health Insurance 2015 (appendix).⁷ Monthly income (converted to US\$ from Peruvian currency), among physicians and nurses, was collected through the question “Considering all your paid activities, what is your monthly income level?” Possible responses were less than \$314, \$314–629, \$629–943, \$943–1258, \$1258–1572, and more than \$1572. The main exposure was gender and potential confounder variables included in the model were region, average working years in the health

sector, specialty, type of institution, average working hours per week, type of contract, number of dependants at home, being a specialist, and university of graduation.

We set the mean monthly income to depend on covariates using a log link function (appendix). All tests were two-tailed with a 5% significance level. Separate models were fitted for physicians and nurses using R, version 3.4.

Data from the survey included 5067 health professionals, but 94 (2%) were excluded because information on salary was missing. Among the remaining 4973 observations, 2154 (43%) were physicians and 2819 (57%) were nurses.

Among physicians, 1601 (74%) were male, mean age was 46 years (SD 10), the mean working time as a health-care professional was 17 years (SD 10), and 1429 (66%) physicians had been trained on a clinical specialty. Men were more likely to be older, to have more years working as health-care professionals, to have an extra job, and to have training on a clinical specialty than women (appendix).

Among nurses, 217 (8%) were male, mean age was 43 years (SD 11), the mean working time as health professional was 16 years (SD 10), and

1452 (51%) nurses had been trained on a clinical specialty. Men were more likely than women to be younger, to have fewer years working as health-care professionals, and to have an extra job, and were less likely to have training on a clinical specialty.

In an unadjusted analysis, monthly income among male physicians was 18% higher than that of female physicians (e^{β} 1.18, 95% CI 1.14–1.22; $p < 0.001$) and male nurses had a non-significant 1% higher monthly income than female nurses (e^{β} 1.01, 0.98–1.04; $p = 0.513$; where e^{β} is the associated multiplicative effect on the mean of a one unit increase in the covariate). The male–female distribution by monthly income band is shown in the figure. After adjusting for region, number of years working in the health sector, specialty, type of institution, average working hours per week, type of contract, and number of dependants at home, monthly income was 8% higher in male physicians than in female physicians (e^{β} 1.08, 1.05–1.10; $p < 0.001$) and 9% higher in male nurses than in female nurses (e^{β} 1.09, 1.05–1.12, $p < 0.001$). These estimates did not change when conducting sensitivity analyses for the outcome and considered covariates (appendix).

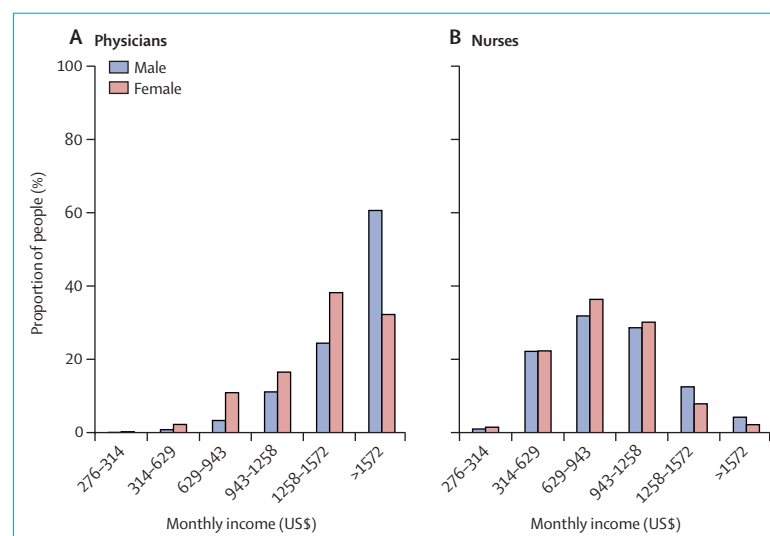


Figure: Distribution of monthly income by gender for physicians and nurses



Published Online
February 7, 2019
[http://dx.doi.org/10.1016/S2214-109X\(19\)30034-8](http://dx.doi.org/10.1016/S2214-109X(19)30034-8)

This online publication has been corrected. The corrected version first appeared at thelancet.com/lancetgh on March 25, 2019, and further corrections were made on May 7, 2019

See Online for appendix

In 2015, the Peruvian National Institute of Statistics and Demographics (INEI) reported that women earn 28.6% less than men, across all types of job. This difference, according to the report, was due to women having to share work hours with home labour and child care, and men tending to work in better-paid jobs such as mining or working more hours than women.⁸ Similar characteristics were found in our sample, for which men were more likely to have an extra job, a higher average number of working hours per week, and more job opportunities or promotions than women.^{9,10} Our findings found that women were less likely to have a permanent contract and have on average fewer years working in the health-care institution than men. However, after controlling for these characteristics, the disparity in income remained significant.

Some limitations of this study need to be addressed. The data on salary were self-reported and therefore subject to misreporting or recall bias. Additionally, salary information was captured by use of intervals instead of the exact value. The reduced resolution in the income variable would lower power to detect smaller differences; however, by modelling the underlying continuous income variable we were able to capture small differences.

In this survey, 40% of male and 68% of female physicians reported a monthly income lower than \$1572 (approximately 6.6 times the minimal wage) whereas 50% of male and female physicians in the USA reported a monthly income lower than \$18 441 in 2006 and \$13 773 in 2010, approximately 14 times (for 2006) and 10.4 times (for 2010) the federal minimum wages of \$7.5 per hour established in 2009.¹ Therefore, with a salary much closer to the minimum wage than in other societies, an 8% difference in salary between men and women could have stronger negative effects among health professionals in LMICs.

According to the Peruvian Health Minister, in 2017 the physician workforce was estimated to be 40 820 professionals and the nurse workforce to be 44 790 professionals.¹¹ However, the gap in human resources will probably not be met until 2027 and 2024, respectively.¹² After the INEI reported a gap in salaries in Peru in 2015, a law against salary discrimination based on sex was approved.¹³ Although this action represents an important advancement to fight discrimination, local policies still need to be evidence-based. The presented study addresses this often-neglected topic.

We declare no competing interests. This study was supported by Dirección de Gestión de la Investigación at the PUCP through grant DGI-2017-496.

Copyright © 2019 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

**Víctor G Sal y Rosas, Miguel Moscoso-Porras, Rubén Ormeño, Fernando Artica, Cristian L Bayes, Jaime Miranda vsalyrosas@pucp.edu.pe*

Department of Science, Pontificia Universidad Católica del Perú, Lima 32, Peru (VGSyR, RO, FA, CLB); CRONICAS Center of Excellence in Chronic Diseases, Universidad Peruana Cayetano Heredia, Lima, Peru (MM-P, JJM); and Department of Medicine, School of Medicine, Universidad Peruana Cayetano Heredia, Lima, Peru (JJM)

- 1 Jena AB, Olenski AR, Blumenthal DM. Sex differences in physician salary in US public medical schools. *JAMA Intern Med* 2016; **176**: 1294–304.
- 2 Jaggi R, Griffith KA, Stewart A, Sambuco D, DeCastro R, Ubel PA. Gender differences in salary in a recent cohort of early-career physician-researchers. *Acad Med* 2013; **88**: 1689–99.
- 3 Greene J, El-Banna MM, Briggs LA, Park J. Gender differences in nurse practitioner salaries. *J Am Assoc Nurse Pract* 2017; **29**: 667–72.
- 4 Muench U, Sindelar J, Busch SH, Buerhaus PJ. Salary differences between male and female registered nurses in the United States. *JAMA* 2015; **313**: 1265–67.
- 5 Alcalde-Rabanal JE, Lazo-Gonzalez O, Nigenda G. The health system of Peru. *Salud publica de Mexico* 2011; **53** (suppl 2): s243–54 (in Spanish).
- 6 Mayta-Tristán P, Dulanto-Pizzorni A, Miranda JJ. Low wages and brain drain: an alert from Peru. *Lancet* 2008; **371**: 1577.
- 7 Superintendencia Nacional de Salud. Encuesta Nacional de Satisfacción de Usuarios en Salud (ENSUSALUD 2015). 2015. <http://portales.susalud.gob.pe/web/portal/239> (accessed May 1, 2018).

- 8 Instituto Nacional de Estadística e Informática. Perú, Brechas de Género 2016: Avances hacia la igualdad de mujeres y hombres. 2016. https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1388/Libro.pdf (accessed May 1, 2018).
- 9 Walsh A, Borkowski SC. Gender differences in factors affecting health care administration career development. *Hosp Health Serv Adm* 1995; **40**: 263–77.
- 10 Wright AL, Schwindt LA, Bassford TL, et al. Gender differences in academic advancement: patterns, causes, and potential solutions in one US College of Medicine. *Acad Med* 2003; **78**: 500–08.
- 11 Ministerio de Salud. Información de Recursos Humanos en el Sector Salud, Perú 2017. <http://bvs.minsa.gob.pe/local/MINSA/4559.pdf> (accessed Dec 10, 2018).
- 12 Jimenez MM, Bui AL, Mantilla E, et al. Human resources for health in Peru: recent trends (2007–2013) in the labour market for physicians, nurses and midwives. *Hum Resour Health* 2017; **15**: 69.
- 13 Ley n° 30709. Ley que prohíbe la discriminación remunerativa entre varones y mujeres. *Diario El Peruano* 2017. <https://busquedas.elperuano.pe/normaslegales/ley-que-prohibe-la-discriminacion-remunerativa-entre-varones-ley-n-30709-1600963-1/> (accessed May 1, 2018).