Basic Guide to the World: Trends in Infant Mortality Rates

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Introduction

Infant mortality rate (IMR) has often been used as an indicator of human development (Gerring, Thacker and Alfaro, 2012) or population health (United Nations, 2013). Thus, a basic understanding of the world would include a study of infant mortality rates.

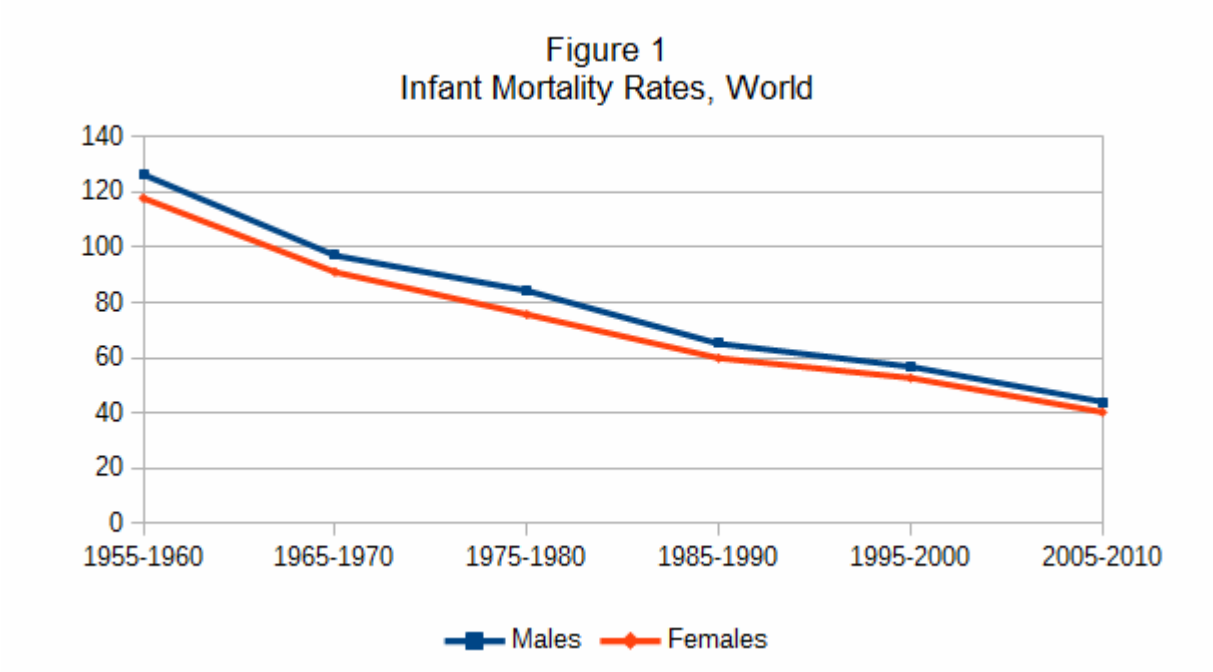
A great deal of research has been conducted about IMR, indicating that lower IMR is associated with higher GDP per capita and education (Pamuk, Fuchs and Lutz, 2011; Wang et al, 2014), better water and sanitation (Cheng, Schuster-Wallace, Watt, Newbold and Mente, 2012), better access to health care (Gruber, Hendren and Townsend, 2014), more foreign aid (Arndt, Jones, Tarp, 2013) having a history of democracy (Gerring, Thacker and Alfaro, 2012), and in Sub-Saharan Africa, with democratization (Kudamatsu, 2012). Wang et al (2014) attribute the reduction to higher income, more education, and to "secular trends", which include some of the above characteristics and also improved infrastructure (e.g., roadways).

However, IMR is often a problematic measure. IMR is often under reported, especially in poorer countries, because infant deaths are less likely to be reported (Anthopolos and Becker, 2010). For example, Gonzalez (2014) reports that IMR is substantially under-counted in Cuba. In addition, the UN indicates that data sources for mortality vary in quality over time, and among countries (United Nations, 2013) and similarly, UNICEF indicates that many countries do not have complete vital registration system, and so may not accurately record all births and deaths (UNICEF, 2014). There are a variety of ways to deal with these problems, including statistical estimates of data quality and statistical adjustments (United Nations, 2013), and the use of multiple sources of data, such as population censuses, household surveys and sample registration systems, where vital registration systems are insufficient (UNICEF, 2014).

Thus, the way to understand this report, and any report about IMR, is to not focus too much on numerical details, but to look for broad patterns, especially ones that are consistent with other indicators of human development or wellness. Where multiple indicates tell the same story, we can have more confidence in the truth of any of them.

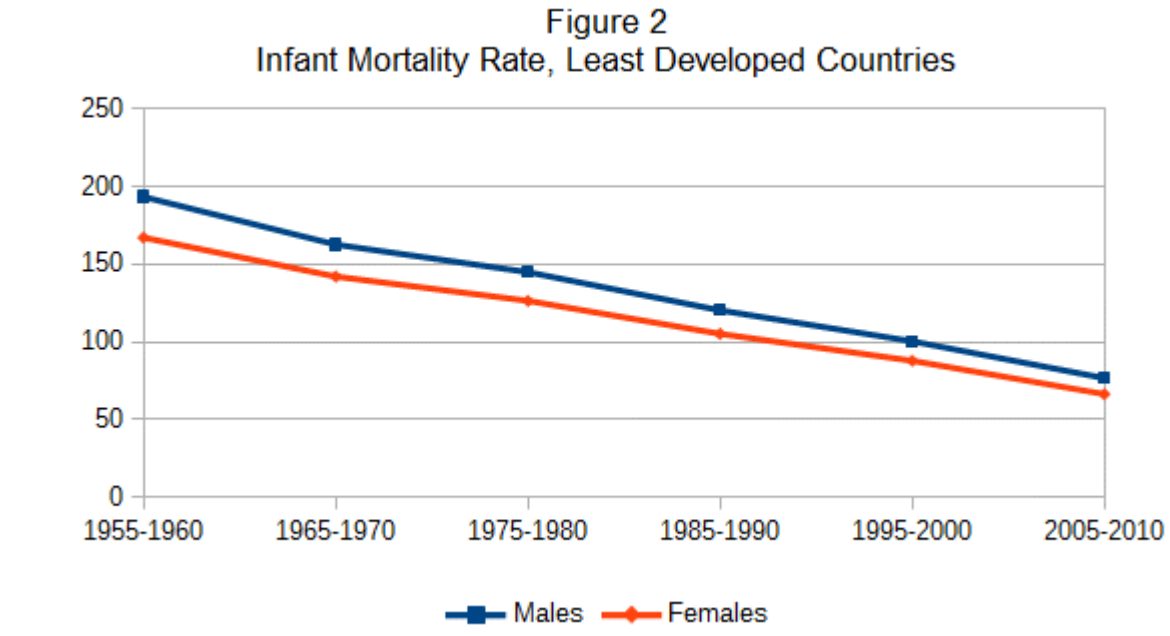
Worldwide IMR trends

The major trend in IMR over the past half century, worldwide, has been a steady decline. The decline has been about the same for both males and females. Male IMR has been slightly higher than has been female IMR.



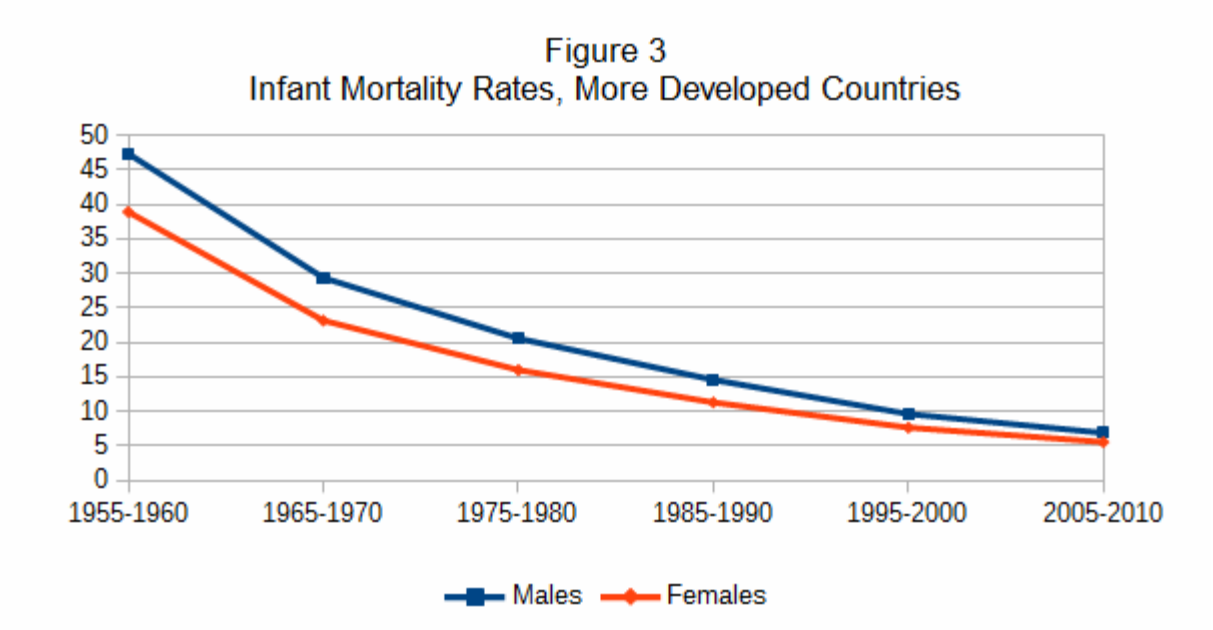
IMR Trends in Least Developed Countries

The major trend in IMR among the Least Developed Countries (LDC) has also been a steady decline, for both males and females. IMR for both declined about 60%.



IMR Trends in More Developed Countries

IMR has also declined among the More Developed Countries (MDC), at about the same rate for males and females. IMR declined for both about 85%.



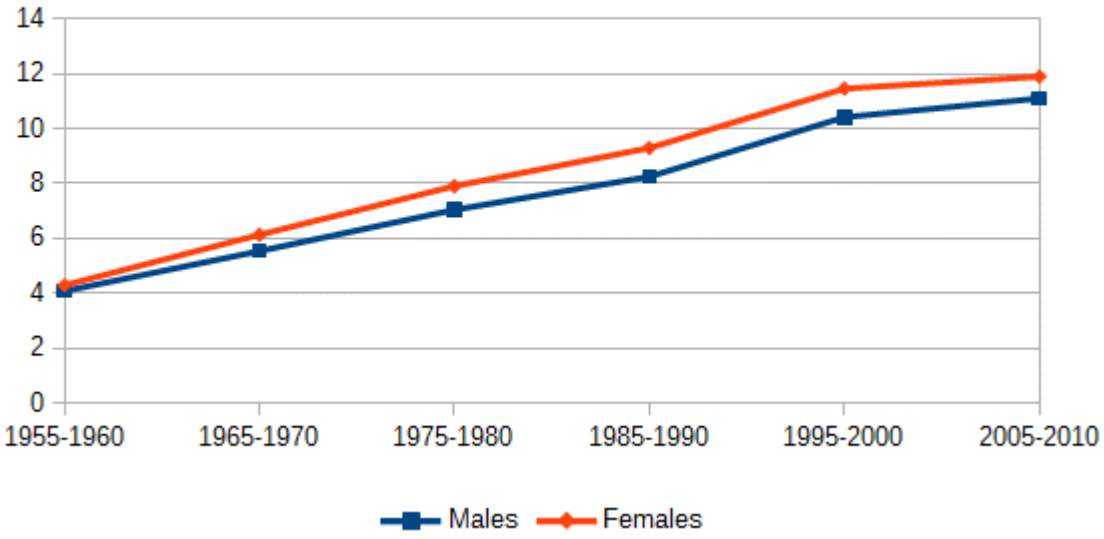
Ratio of IMR, Least to More Developed Countries

In this section, we examine the ratio of IMR in LDCs to IMR in MDCs. For example, in 1955-1960, the IMR for males in the LDCs was 193.5, and the IMR for males in the MDCs was 47.3. The ratio of these two (193.5/47.3) was 4.1. By 2005-2010, the IMR for males in the LDCs was 76.7, and the IMR for males in the MDCs was 6.9. The ratio of these two (76.7/6.9) was 11.1.

	Least Developed Countries	More Developed Countries	Ratio
IMR, males, 1955-1960	193.5	47.3	4.1
IMR, males, 2005-2010	76.7	6.9	11.1

Unfortunately, figure 4 shows that IMR has become more unequal over the past half century. IMR declined worldwide, but declined more among MDCs than it did among the LDCs. At the start of this time, IMR among LDCs was 4 times higher than was IMR among MDCs. At the end of this time, IMR among LDCs was 11 times higher than was IMR among MDCs. The trend was pretty much the same among males and females.

Figure 4
Ratio of IMR, Least to More Developed Countries



IMR: 1955-1960 compared to 2005-2010

There is a fairly high correlation between IMR in 1955-1960 and IMR in 2005-2010 (0.72). That means that, overall, most countries that had high IMR in 1955-1960 still had high IMR in 2005-2010, compared to other countries. IMR declined in all countries, but most countries that started off among the worst stayed among the worst.

However, while **most** high IMR countries remained high IMR countries, this is not true for **all** high IMR countries. A number of countries, including Afghanistan, Angola, Burkina Faso, Côte d'Ivoire, Guinea, Sierra Leone and South Sudan were among the 20 countries with the highest IMR in 1955-1960 and remained in the 20 countries with the highest IMR in 2005-2010. Several other countries, though, started with the highest IMRs. By 2005-1010, though, their IRMs were still high, but not among the highest. These countries included Bhutan, Liberia, Nepal, Timor-Leste and Yeman. A few countries, including Egypt, Iran, Libya, Maldives, Tunisia and Turkey, made an even larger transition, from having the highest IMR to having IRMs in the middle ranks.

Clearly, there are many factors involved in reducing IMR, so those stuck with high IMRs at one time are not doomed to remain with those bad conditions.

Table 1
20 countries with highest IRM in that time period (unshaded boxes)

Country	1955-1960		Country	2005-2010
Afghanistan	261.75		Afghanistan	78.28
Angola	215.04		Angola	104.35
Bhutan	238.95		Bhutan	40.83
Burkina Faso	209.14		Burkina Faso	80.40
			Burundi	93.45
			Cameroon	82.47
			Central African Republic	105.48
			Chad	105.30
Côte d'Ivoire	236.91		Côte d'Ivoire	86.57
			Democratic Republic of the Congo	115.90
Egypt	204.63		Egypt	23.46
			Equatorial Guinea	101.73
Guinea	200.11		Guinea	80.99
			Guinea-Bissau	101.94
Iran (Islamic Republic of)	197.62		Iran	20.70
Liberia	218.49		Liberia	71.80
Libya	230.08		Libya	16.79
			Malawi	95.24
Maldives	226.50		Maldives	15.22
Mali	223.84		Mali	100.29
Mozambique	201.60		Mozambique	87.12
Nepal	201.14		Nepal	44.71
			Nigeria	89.93
Sierra Leone	229.39		Sierra Leone	127.18
			Somalia	89.78
South Sudan	226.18		South Sudan	89.66
Timor-Leste	241.82		Timor-Leste	50.98
Tunisia	218.03		Tunisia	18.70
Turkey	201.77		Turkey	16.39
Yemen	297.25		Yemen	61.31

Data Source

Data from: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision, New York, 2013
http://data.un.org/

References

Rebecca Anthopolos, Charles M. Becker. Global Infant Mortality: Correcting for Undercounting. World Development. Volume 38, Issue 4, April 2010, Pages 467–481
http://www.sciencedirect.com/science/article/pii/S0305750X09002046 and
http://econ.duke.edu/people/becker/research

Channing Arndt, Sam Jones and Finn Tarp. Assessing Foreign Aid's Long-Run Contribution to Growth in Development. WIDER Working Paper No. 2013/072.
http://wider.unu.edu/stc/repec/pdfs/wp2013/WP2013-072.pdf
and also here
Channing Arndt, Sam Jones, Finn Tarp, Assessing Foreign Aid's Long Run Contribution to Growth and Development, World Development, Available online 18 January 2014, ISSN 0305-750X, http://dx.doi.org/10.1016/j.worlddev.2013.12.016.
(http://www.sciencedirect.com/science/article/pii/S0305750X13003008)

June J Cheng, Corinne J Schuster-Wallace, Susan Watt, Bruce K Newbold and Andrew Mente. An ecological quantification of the relationships between water, sanitation and infant, child, and maternal mortality. Environ Health. 2012 Jan 27;11:4 http://www.ehjournal.net/content/11/1/4

John Gerring, Strom Thacker and Rodrigo Alfaro. Democracy and Human Development. Journal of Politics 74:1 (January 2012) http://blogs.bu.edu/jgerring/comparative-politics/

Gonzalez, Robert M, Underreporting of the Infant Mortality Rate: Evidence and Adjustments for Cuba (May 27, 2014). Available at SSRN: http://ssrn.com/abstract=2442565 or http://dx.doi.org/10.2139/ssrn.2442565

Jonathan Gruber, Nathaniel Hendren, and Robert M. Townsend. The Great Equalizer: Health Care Access and Infant Mortality in Thailand. Am Econ J Appl Econ. Jan 1, 2014; 6(1): 91–107.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3998713/

Masayuki Kudamatsu. Has Democratization Reduced Infant Mortality in Sub-Saharan Africa? Evidence from Micro Data. Journal of the European Economic Association, 10, pp. 1294-1317. December 2012. https://sites.google.com/site/mkudamatsu/

Elsie R. Pamuk, Regina Fuchs and Wolfgang Lutz. Comparing Relative Effects of Education and Economic Resources on Infant Mortality in Developing Countries. Population and Development Review. Volume 37, Issue 4, pages 637–664, December 2011.
http://onlinelibrary.wiley.com/doi/10.1111/j.1728-4457.2011.00451.x/abstract

Unicef. Under Five Mortality, Current Status and Progress. 2014. http://data.unicef.org/child-mortality/under-five see the Notes on the Data section.

United Nations. The World Mortality Report 2013. United Nations, Department of Economic and Social Affairs, Population Division.
http://www.un.org/en/development/desa/population/publications/mortality/world-mortality-report-2013.shtml

Wang, Haidong, and others, see below. Global, regional, and national levels of neonatal, infant, and under-5 mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet. 2014 May 2. doi: 10.1016/S0140-6736(14)60497-9.
http://www.healthdata.org/research-article/global-regional-and-national-levels-neonatal-infant-and-under-5-mortality-during
Complete list of authors: Wang H, Liddell CA, Coates MM, Mooney MD, Levitz CE, Schumacher AE, Apfel H, Iannarone M, Phillips B, Lofgren KT, Sandar L, Dorrington RE, Rakovac I, Jacobs TA, Liang X, Zhou M, Zhu J, Yang G, Wang Y, Liu S, Li Y, Abbasoglu Ozgoren A, Abera SF, Abubakar I, Achoki T, Adelekan A, Ademi Z, Alemu ZA, Allen PJ, AlMazroa MA, Alvarez E, Amankwaa AA, Amare AT, Ammar W, Anwari P, Argeseanu Cunningham S, Asad MM, Assadi R, Banerjee A, Basu S, Bedi N, Bekele T, Bell ML, Bhutta Z, Blore J, Basara BB, Boufous S, Breitborde N, Bruce NG, Bui LN, Carapetis JR, Cárdenas R, Carpenter DO, Caso V, Castro RE, Catalá-Lopéz F, Cavlin A, Che X, Chiang PP, Chowdhury R, Christophi CA, Chuang T, Cirillo M, da Costa Leite I, Courville KJ, Dandona L, Dandona R, Davis A, Dayama A, Deribe K, Dharmaratne SD, Dherani MK, Dilmen U, Ding EL, Edmond KM, Ermakov SP, Farzadfar F, Fereshtehnejad SM, Fijabi DO, Foigt N, Forouzanfar MH, Garcia AC, Geleijnse JM, Gessner BD, Goginashvili K, Gona P, Goto A, Gouda HN, Green MA, Greenwell KF, Gugnani HC, Gupta R, Hamadeh RR, Hammami M, Harb HL, Hay S, Hedayati MT, Hosgood HD, Hoy DG, Idrisov BT, Islami F, Ismayilova S, Jha V, Jiang G, Jonas JB, Juel K, Kabagambe EK, Kazi DS, Kengne AP, Kereselidze M, Khader YS, Khalifa SEAH, Khang Y, Kim D, Kinfu Y, Kinge JM, Kokubo Y, Kosen S, Defo B, Kumar GA, Kumar K, Ravi B Kumar RB, Lai T, Lan Q, Larsson A, Lee J, Leinsalu M, Lim SS, Lipshultz SE, Logroscino G, Lotufo PA, Lunevicius R, Lyons RA, Ma S, Mahdi AA, Marzan MB, Mashal MT, Mazorodze TT, McGrath JJ, Memish ZA, Mendoza W, Mensah GA, Meretoja A, Miller TR, Mills EJ, Mohammad KA, Mokdad AH, Monasta L, Montico M, Moore AR, Moschandreas J, Msemburi WT, Mueller UO, Muszynska MM, Naghavi M, Naidoo KS, Narayan KMV, Nejjari C, Ng M, Ngirabega JD, Nieuwenhuijsen MJ, Nyakarahuka L, Ohkubo T, Omer SB, Paternina Caicedo AJ, Pillay-van Wyk V, Pope D, Prabhakaran D, Rahman SUR, Rana SM, Reilly RQ, Rojas-Rueda D, Ronfani L, Rushton L, Saeedi MY, Salomon J, Sampson U, Santos IS, Sawhney M, Schmidt JC, Shakh-Nazarova M, She J, Sheikhbahaei S, Shibuya K, Shin HH, Shishani K, Shiue I, Sigfusdottir ID, Singh JA, Skirbekk V, Sliwa K, Soshnikov SS, Sposato LA, Stathopoulou VK, Stroumpoulis K, Tabb KM, Talongwa RT, Teixeira CM, Terkawi AS, Thomson AJ, Thorne-Lyman AL, Toyoshima H, Dimbuene ZT, Uwaliraye P, Uzun SB, Vasankari TJ, Vasconcelos AMN, Vlassov VV, Vollset SE, Waller S, Wan X, Weichenthal S, Weiderpass E, Weintraub RG, Westerman R, Wilkinson JD, Williams HC, Yang YC, Yentur GK, Yip P, Yonemoto N, Younis M, Yu C, Jin KY, Zaki MES, Zhu S, Vos T, Lopez AD, Murray CJL.