

Online Resource 1

S.1 Explanations of figures and tables

Figure S1 shows that our results are not sensitive to our choice of cutoff for inclusion in the international sample used in Table 3. It plots coefficients on the interaction of population density and open defecation from column 1 of Table 3, allowing the cutoff for inclusion in the sample to range from 5 to 15 years before the survey. The point estimate is essentially numerically unchanged. The confidence intervals are wider when births further back in time are included. This is consistent with greater measurement error in the independent variable for children born more years before the survey: children who were born long before the DHS experienced somewhat different early life conditions than what is measured by the DHS. However, the stability of the main result means that there is no reason to believe that our choice of cutoff biases the estimate of the interaction of population density and open defecation.

Figure S2 shows that the distribution of the log of population densities in our international sample, used for the analysis in section 3.3, follows approximately a normal distribution.

In order to verify the appropriateness of using the log of population density in our main regression results, rather than some other transformation of the data, Figure S3 presents results of 11 estimates using Box-Cox transformations. We transform population density with Box-Cox parameter lambda at intervals of 0.1 from 0 (which is equivalent to our preferred log specification) to 1 (which is equivalent to population density being entered linearly). Because log likelihood is maximized between 0 and 0.2, and is lowest at the linear specification 1, we conclude from this figure that our log transformation is the most useful combination of model fit, theoretical appropriateness, and ease of interpretation. However, we further plot *t* statistics on the interaction for the convenience of the reader, and note that our main result is qualitatively robust to this entire range of respecifications, with the interaction statistically significant at the .10 level in all cases, including intermediate values of lambda with no principled motivation, and at the .05 level in 6 of 11 cases. Therefore, this robustness check can increase confidence that our results are not spuriously due to any fragile log modeling choice.

Table S1 lists the data sources for the population density variable used in the analysis in section 3.3.

Table S2 uses the Bangladesh data set described in section 4.1 to show results of regressions of infant mortality on the interaction of population density and open defecation. These results complement the analysis shown in 4 of the text. Column 1 shows a regression of whether or not an infant died on PSU level open defecation, population density in his/her local area, and the interaction of these two variables. Column 2 adds fixed effects for region and finds a similar, positive, interaction of open defecation and population to what was reported in column 1. Columns 3 and 4 present falsification tests that find that the interaction of community-level electrification and population density does not similarly predict IMR, nor does the interaction of community-level radio ownership and population density.

Table S3 shows the results of a mechanism check that supports our main results. In Table S3, we regress child weight-for-height (computed using the World Health Organization 2006 norms), a measure of exposure to disease in the short and medium run, on the interaction of population density and open defecation. The coefficient is negative and numerically similar across specifications; it is more precisely estimated when we control for height (column 2). Just as it is important to control for age when using height-for-age as a dependent variable (Cummins 2013), it is important to control for height when using weight-for-height as a dependent variable. This ensures that our estimation strategy is robust to any possible functional form of the mean height-weight relationship in the sample population that may differ from the WHO norms. Column 3 adds additional controls for the child's

age, sex, and their interaction.

Table S4 shows the results of a robustness check that controls for the age of the child's mother at the time of the child's birth. Column 1 of Table S4 reproduces the results of column 1 of Table 3 in the main text. Column 2 additionally controls for the mother's age at the time of the child's birth. The coefficient on the interaction of population density and open defecation is of a similar magnitude, and it is statistically significant. Column 3 reproduces the results of column 2 of Table 3, and column 4 adds a control for mother's age at the time of the child's birth. Again, the coefficient on the interaction of population density and open defecation is of a similar magnitude, and it is statistically significant.

Table S5 shows the results of a robustness check that adds interactions of population density and community-level infectious disease behaviors other than open defecation to regressions of the form presented in column 1 of Table 3 in the main text. This table shows that community-level infectious disease behaviors, like the fraction of children with a BCG vaccine (column 2), or a measles vaccine (column 3), do interact with population density to predict infant mortality. This is not surprising: we would expect infectious diseases like BCG and measles to spread more easily in places where unvaccinated children live closer together than they do in places where children live farther apart. There is also suggestive, though not statistically significant, evidence that whether or not children under 5 sleep under a bed net (column 4) may also interact with population density to predict infant mortality. However, our main result, that the fraction of the PSU practicing open defecation interacts with population density to predict infant mortality, is nevertheless robust to controlling for the interaction of each of these measures of community-level infectious disease behavior with population density. The interaction of population density and open defecation is not merely proxying for the interaction of population density and other community-level infectious disease behaviors.

S.2 Measurement error in the independent variables

This section of the appendix considers the implications of measurement error for our finding that population density interacts with local open defecation to predict child health outcomes. One source of measurement error is that our data on open defecation come from a sample survey, rather than a census, so local open defecation to which a child is exposed is measured with error. Because the DHS chose a random sample of households in each PSU, this source of measurement error is classical measurement error. Classical measurement error leads to attenuation bias; that is, it biases coefficients toward zero. Therefore, measurement error in the open defecation variable would bias *against* finding a result.

The population density data present a second source of measurement error. We would like to be able to measure population density in a child's local area in the year of her birth, but our data on population density in the international sample are at the region level, and are from a single year, rather than the year of the child's birth. We do not think that using population density data from a year other than that of the child's birth is biasing in favor of our results because we see no systematic change in our results if births further back before the survey are included in the sample, other than increasing noise in the coefficient estimate (see Figure S1). This is consistent with increasing measurement error, but inconsistent with bias. Nor do we believe that using data from the region, rather than the local level, in our international sample, would bias in favor of our result. Some evidence for this is that we find quantitatively similar robust estimates in Bangladesh as we do in our international sample; in the Bangladeshi case our population densities are measured with considerably less error because the geographic units are much smaller than DHS sub-national regions in our international analysis.

Finally, because our coefficient of interest is on an interaction, it is also useful to ask: what is the effect of measurement error in an independent variable on the estimated coefficient of an interaction?

Jaccard and Wan (1995) have shown that the familiar attenuation bias effect of measurement error is extended to the case of interactions: we would expect the coefficient on the interaction to be attenuated towards zero.

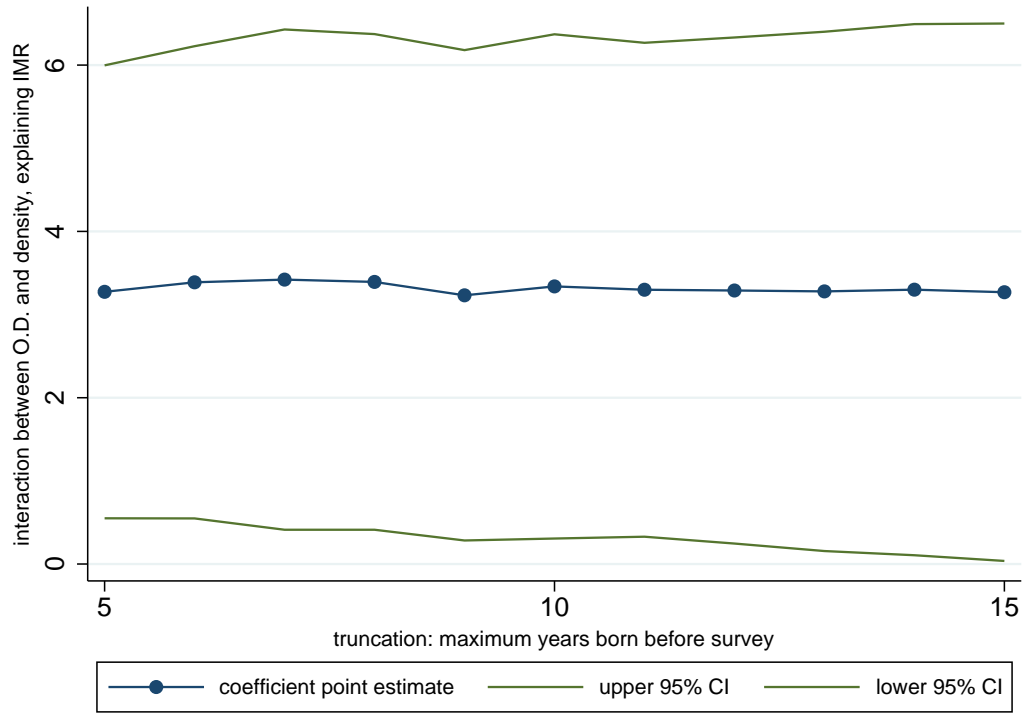


Figure S1: Coefficient on the population density-open defecation interaction does not depend on sample truncation

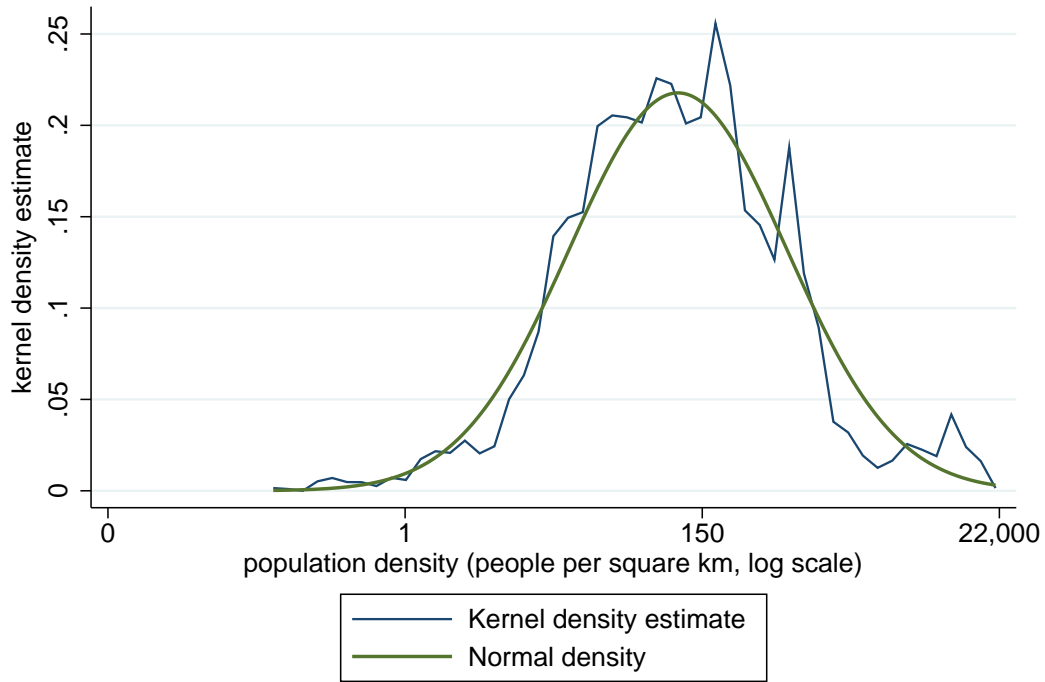


Figure S2: Distribution of population densities, international sample

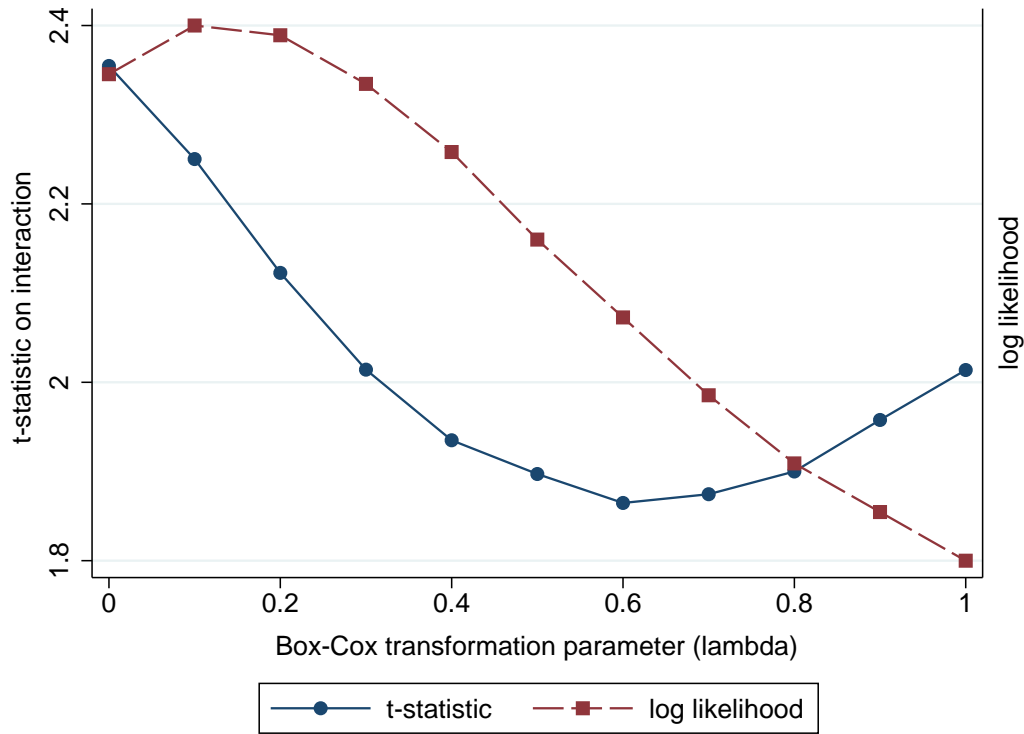


Figure S3: Box-cox transformation parameters and associated *t*-statistics for regression in column 1 of table 3

Table S1: International sample of 172 DHS

| country | year | online source | ultimate source |
|--------------------------|------|---------------|---|
| Albania | 2008 | wikipedia | Institute of Statistics of Albania. 2011. |
| Armenia | 2000 | geohive | National Statistical Service. (2001 & 2011) |
| Armenia | 2005 | geohive | National Statistical Service. (2001 & 2011) |
| Armenia | 2010 | geohive | National Statistical Service. (2001 & 2011) |
| Azerbaijan | 2006 | geohive | State Statistical Committee. |
| Bangladesh | 1993 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Bangladesh | 1996 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Bangladesh | 1999 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Bangladesh | 2004 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Bangladesh | 2007 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Bangladesh | 2011 | wikipedia | Bureau of Statistics, Population Census Wing. |
| Benin | 1996 | statoids | Troisième Recensement General de la Population et de l'Habitation. |
| Benin | 2001 | statoids | Troisième Recensement General de la Population et de l'Habitation. |
| Benin | 2006 | statoids | Troisième Recensement General de la Population et de l'Habitation. |
| Bolivia | 1998 | statoids | Instituto Nacional de Estadística, Table of department populations. |
| Bolivia | 2003 | statoids | Instituto Nacional de Estadística, Table of department populations. |
| Brazil | 1991 | geohive | IBGE , Brazil. |
| Brazil | 1996 | geohive | IBGE , Brazil. |
| Burkina Faso | 1993 | wikipedia | National Census. (2006) |
| Burkina Faso | 1998 | wikipedia | National Census. (2006) |
| Burkina Faso | 2003 | geohive | Institut National de la Statistique et de la Demographie. |
| Burkina Faso | 2010 | geohive | Institut National de la Statistique et de la Demographie. |
| Burundi | 2010 | geohive | ISTEEBU, Bujumbura, Burundi. |
| Cambodia | 2000 | geohive | National Institute of Statistics, Cambodia. |
| Cambodia | 2005 | geohive | National Institute of Statistics, Cambodia. |
| Cambodia | 2010 | geohive | National Institute of Statistics, Cambodia. |
| Cameroon | 1991 | geohive | National Institute of Statistics, Cameroon. |
| Cameroon | 1998 | geohive | National Institute of Statistics, Cameroon. |
| Cameroon | 2004 | geohive | National Institute of Statistics, Cameroon. |
| Cameroon | 2011 | geohive | National Institute of Statistics, Cameroon. |
| Central African Republic | 1994 | geohive | Census 2003, Central African Republic. |
| Chad | 1996 | statoids | Census of Chad. (1993) |
| Chad | 2004 | statoids | Census of Chad. (2009) |
| Colombia | 1990 | geohive | Departamento Administrativo Nacional de Estadística. |
| Colombia | 1995 | geohive | Departamento Administrativo Nacional de Estadística. |

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Table S1: International sample of 172 DHS

| country | year | online source | ultimate source |
|--------------------|------|-------------------|--|
| Colombia | 2000 | wikipedia | Census of Colombia. (2005) |
| Colombia | 2005 | wikipedia | Census of Colombia. (2005) |
| Colombia | 2010 | wikipedia | Census of Colombia. (2005) |
| Comoros | 1996 | geohive | Commissariat General du Plan, Union des Comores. |
| Congo | 2007 | geohive | http://www.cd.undp.org |
| Congo Brazzaville | 2005 | geohive | Centre National de la Statistique et des Études Économiques. |
| Congo Brazzaville | 2011 | geohive | Centre National de la Statistique et des Études Économiques. |
| Côte d'Ivoire | 1994 | citypopulation.de | Institut National de la Statistique. |
| Côte d'Ivoire | 1998 | citypopulation.de | Institut National de la Statistique. |
| Côte d'Ivoire | 2011 | citypopulation.de | Institut National de la Statistique. |
| Dominican Republic | 1991 | geohive | Oficina Nacional de Estadística. |
| Dominican Republic | 1996 | geohive | Oficina Nacional de Estadística. |
| Dominican Republic | 1999 | geohive | Oficina Nacional de Estadística. |
| Dominican Republic | 2002 | geohive | Oficina Nacional de Estadística. |
| Dominican Republic | 2007 | geohive | Oficina Nacional de Estadística. |
| Egypt | 1992 | statoids | Central Agency for Public Mobilization and Statistics. |
| Egypt | 1995 | statoids | Central Agency for Public Mobilization and Statistics. |
| Egypt | 2000 | statoids | Central Agency for Public Mobilization and Statistics. |
| Egypt | 2005 | statoids | Central Agency for Public Mobilization and Statistics. |
| Egypt | 2008 | statoids | Central Agency for Public Mobilization and Statistics. |
| Ethiopia | 2000 | geohive | CSA, Ethiopia. |
| Ethiopia | 2005 | geohive | CSA, Ethiopia. |
| Ethiopia | 2011 | geohive | CSA, Ethiopia. |
| Gabon | 2000 | geohive | Direction Generale de la Statistique et des Etudes Economiques. |
| Gabon | 2012 | geohive | Direction Generale de la Statistique et des Etudes Economiques. |
| Ghana | 1993 | statsghana | Ghana Statistical Service. |
| Ghana | 1998 | statsghana | Ghana Statistical Service. |
| Ghana | 2003 | statsghana | Ghana Statistical Service. |
| Ghana | 2008 | statsghana | Ghana Statistical Service. |
| Guatemala | 1995 | indexmundi | FAO and World Bank population estimates. |
| Guinea | 1999 | geohive | Institut National de la Statistique, Guinea. |
| Guinea | 2005 | geohive | Institut National de la Statistique, Guinea. |
| Guyana | 2009 | geohive | Statistics Guyana. |
| Haiti | 1994 | geohive | Institut Haïtien de Statistique et d'Informatique (IHSI), Haiti. |
| Haiti | 2000 | geohive | Institut Haïtien de Statistique et d'Informatique (IHSI), Haiti. |
| Haiti | 2005 | geohive | Institut Haïtien de Statistique et d'Informatique (IHSI), Haiti. |
| Haiti | 2012 | geohive | Institut Haïtien de Statistique et d'Informatique (IHSI), Haiti. |

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Table S1: International sample of 172 DHS

| country | year | online source | ultimate source |
|-----------------|------|-----------------|--|
| Honduras | 2005 | geohive | Instituto Nacional de Estadística, Honduras. |
| Honduras | 2011 | geohive | Instituto Nacional de Estadística, Honduras. |
| India | 1992 | censusindia.gov | Census of India. (1991) |
| India | 1998 | censusindia.gov | Census of India. (2001) |
| India | 2005 | wikipedia | Census of India. (2011) |
| Indonesia | 2002 | geohive | Biro Pusat Statistik. |
| Indonesia | 2007 | geohive | Biro Pusat Statistik. |
| Indonesia | 2012 | geohive | Biro Pusat Statistik. |
| Jordan | 1997 | geohive | Department of Statistics, Amman, Jordan. |
| Jordan | 2002 | indexmundi | FAO and World Bank population estimates. |
| Kazakhstan | 1995 | geohive | National Statistical Agency of Kazakhstan. |
| Kazakhstan | 1999 | geohive | National Statistical Agency of Kazakhstan. |
| Kenya | 1993 | statoids | Census of Kenya. (1999) |
| Kenya | 1998 | statoids | Census of Kenya. (1999) |
| Kenya | 2003 | geohive | Kenya National Bureau of Statistics. |
| Kenya | 2008 | geohive | Kenya National Bureau of Statistics. |
| Kyrgyz Republic | 1995 | geohive | National Statistical Committee, Kyrgyz Republic. |
| Lesotho | 2004 | geohive | Lesotho Bureau of Statistics. |
| Lesotho | 2009 | geohive | Lesotho Bureau of Statistics. |
| Liberia | 2007 | wikipedia | 2008 National Population and Housing Census. |
| Madagascar | 1992 | statoids | Census of Madagascar. (1993) |
| Madagascar | 1997 | statoids | Census of Madagascar. (1993) |
| Madagascar | 2003 | statoids | Census of Madagascar. (1993) |
| Madagascar | 2008 | geohive | Institut National de la Statistique, Madagascar. |
| Malawi | 1992 | geohive | National Statistical Office, Malawi. |
| Malawi | 2000 | geohive | National Statistical Office, Malawi. |
| Malawi | 2004 | geohive | National Statistical Office, Malawi. |
| Malawi | 2010 | geohive | National Statistical Office, Malawi. |
| Maldives | 2009 | wikipedia | Census of Maldives. (2006) |
| Mali | 1995 | geohive | Institut National de la Statistique du Mali, Mali. |
| Mali | 2001 | geohive | Institut National de la Statistique du Mali, Mali. |
| Mali | 2006 | geohive | Institut National de la Statistique du Mali, Mali. |
| Moldova | 2005 | geohive | Department of Statistics and Sociological Analysis, Moldova. |
| Morocco | 1992 | statoids | Europa World Year Book. (2001) |
| Morocco | 2003 | geohive | Haut Commissariat au Plan, Morocco. |
| Mozambique | 1997 | geohive | INE, Mozambique. |
| Mozambique | 2003 | geohive | INE, Mozambique. |
| Mozambique | 2011 | geohive | INE, Mozambique. |
| Namibia | 1992 | indexmundi | FAO and World Bank population estimates. |
| Namibia | 2000 | geohive | Namibia Statistics Agency. |
| Namibia | 2006 | geohive | Namibia Statistics Agency. |
| Nepal | 1996 | geohive | Central Bureau of Statistics, Kathmandu, Nepal. |
| Nepal | 2001 | geohive | Central Bureau of Statistics, Kathmandu, Nepal. |
| Nepal | 2006 | geohive | Central Bureau of Statistics, Kathmandu, Nepal. |

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Table S1: International sample of 172 DHS

| country | year | online source | ultimate source |
|-----------------------|------|---------------|---|
| Nepal | 2011 | wikipedia | National Population and Housing Census. (2011) |
| Nicaragua | 1998 | geohive | INIDE, Nicaragua. |
| Nicaragua | 2001 | geohive | INIDE, Nicaragua. |
| Niger | 1992 | geohive | Institut National de la Statistique, Niger. |
| Niger | 1998 | geohive | Institut National de la Statistique, Niger. |
| Niger | 2006 | geohive | Institut National de la Statistique, Niger. |
| Nigeria | 1999 | indexmundi | FAO and World Bank population estimates. |
| Nigeria | 2003 | indexmundi | FAO and World Bank population estimates. |
| Nigeria | 2008 | indexmundi | FAO and World Bank population estimates. |
| Pakistan | 1990 | geohive | Pakistan Census Organisation, Pakistan. |
| Pakistan | 2006 | geohive | Pakistan Census Organisation, Pakistan. |
| Peru | 1991 | geohive | INEI, Peru. |
| Peru | 1996 | geohive | INEI, Peru. |
| Peru | 2000 | geohive | INEI, Peru. |
| Philippines | 1993 | statoids | Census 2000 of Philippines. |
| Philippines | 1998 | geohive | National Statistics Office, Philippines. |
| Philippines | 2003 | geohive | National Statistics Office, Philippines. |
| Philippines | 2008 | geohive | National Statistics Office, Philippines. |
| Rwanda | 1992 | geohive | National Institute of Statistics of Rwanda (NISR). |
| Rwanda | 2000 | statoids | Census of Rwanda. (2002) |
| Rwanda | 2005 | statoids | Census of Rwanda. (2002) |
| Rwanda | 2010 | geohive | National Institute of Statistics of Rwanda (NISR). |
| São Tomé and Príncipe | 2008 | geohive | Instituto Nacional de Estatística, São Tomé and Príncipe. |
| Senegal | 1992 | indexmundi | FAO and World Bank population estimates. |
| Senegal | 1997 | indexmundi | FAO and World Bank population estimates. |
| Senegal | 2005 | geohive | ANSD, Senegal. |
| Senegal | 2010 | geohive | ANSD, Senegal. |
| Sierra Leone | 2008 | geohive | Statistics Sierra Leone, Sierra Leone. |
| South Africa | 1998 | geohive | Statistics South Africa & The Local Government Handbook. |
| Swaziland | 2006 | geohive | CSO, Swaziland and the National Development Data Centre. |
| Tanzania | 1991 | indexmundi | FAO and World Bank population estimates. |
| Tanzania | 1996 | geohive | National Bureau of Statistics, Tanzania. |
| Tanzania | 1999 | geohive | National Bureau of Statistics, Tanzania. |
| Tanzania | 2004 | geohive | National Bureau of Statistics, Tanzania. |
| Tanzania | 2010 | geohive | National Bureau of Statistics, Tanzania. |
| Timor-Leste | 2009 | geohive | Direcção Nacional de Estatística, Timor-Leste. |
| Togo | 1998 | wikipedia | Direction Générale de la Statistique et de la Comptabilité Nationale. |
| Turkey | 1993 | indexmundi | FAO and World Bank population estimates. |
| Turkey | 1998 | indexmundi | FAO and World Bank population estimates. |
| Turkey | 2003 | indexmundi | FAO and World Bank population estimates. |
| Uganda | 1995 | geohive | Uganda Bureau of Statistics. |

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Table S1: International sample of 172 DHS

| country | year | online source | ultimate source |
|----------------|-------------|----------------------|--|
| Uganda | 2000 | geohive | Uganda Bureau of Statistics. |
| Uganda | 2006 | geohive | Uganda Bureau of Statistics. |
| Uganda | 2011 | geohive | Uganda Bureau of Statistics. |
| Ukraine | 2007 | indexmundi | FAO and World Bank population estimates. |
| Uzbekistan | 1996 | indexmundi | FAO and World Bank population estimates. |
| Vietnam | 1997 | geohive | General Statistical Office, Vietnam. |
| Vietnam | 2002 | geohive | General Statistical Office, Vietnam. |
| Yemen | 1991 | indexmundi | FAO and World Bank population estimates. |
| Zambia | 1992 | geohive | Central Statistical Office, Zambia. |
| Zambia | 1996 | geohive | Central Statistical Office, Zambia. |
| Zambia | 2001 | geohive | Central Statistical Office, Zambia. |
| Zambia | 2007 | geohive | Central Statistical Office, Zambia. |
| Zimbabwe | 1994 | geohive | Central Statistical Office, Zimbabwe. |
| Zimbabwe | 1999 | geohive | Central Statistical Office, Zimbabwe. |
| Zimbabwe | 2005 | geohive | Central Statistical Office, Zimbabwe. |

Table S2: Open defecation interacts with population density to predict infant mortality, Bangladesh

| | (1) | (2) | (3) | (4) |
|--|--|-----------------------------|-----------------------------|-----------------------------|
| | dependent variable: IMR (deaths per 1,000) | | | |
| local open defecation × ln(density) | 21.92 [†] (12.56) | 26.76* (12.35) | | |
| local open defecation | 30.93** (10.82) | 25.73* (12.54) | | |
| local electrification × ln(density) | | | -1.08 (4.57) | |
| local electrification | | | -35.87*** (5.18) | |
| local radio ownership × ln(density) | | | | 3.64 (5.98) |
| local radio ownership | | | | 27.80*** (8.63) |
| ln(density) | -0.635 (1.70) | -0.006 (1.68) | 3.68 [†] (2.14) | -3.15** (1.19) |
| household open defecation | | 9.91 [†] (5.15) | 7.15 (4.48) | 13.51** (4.39) |
| girl | | -9.21*** (2.47) | -9.18*** (2.47) | -9.25*** (2.48) |
| elapsed months, birth to survey | | 0.271*** (0.041) | 0.275*** (0.041) | 0.274*** (0.041) |
| region fixed effects | | $F = 9.58$ $p = 0.0000$ | $F = 10.72$ $p = 0.0000$ | $F = 10.07$ $p = 0.0000$ |
| <i>n</i> (live births) | 41,852 | 41,852 | 41,852 | 41,852 |

Standard errors clustered by survey PSUs in parentheses. Two-sided p -values: [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$.

Table S3: Density of open defecation predicts child weight-for-height, international sample

| | (1) | (2) | (3) |
|--|------------------------|-------------------------|---------------------------|
| | weight-for-height | | |
| local open defecation X $\ln(\text{density})$ | -0.0359 (0.0219) | -0.0385+ (0.0218) | -0.0496* (0.0219) |
| local open defecation $\ln(\text{density})$ | -0.0485 (0.0937) | -0.0468 (0.0939) | -0.0416 (0.0925) |
| household OD | -0.0683*** (0.0161) | -0.0687*** (0.0158) | -0.0898*** (0.0177) |
| height (in cm) | | -0.00492** (0.00163) | -0.0363*** (0.00674) |
| female | | | 0.0444** (0.0139) |
| female X age-in-months | | | -0.00188*** (0.000426) |
| Age-in-months | | | 0.0285*** (0.00503) |
| country Fes | ✓ | ✓ | ✓ |
| <i>n</i> | 292011 | 292011 | 292011 |

Standard errors clustered by survey PSUs in parentheses. Two-sided *p*-values: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$ ***
 $p < 0.001$.

Table S4: Results are not sensitive to controlling for mother's age at child's birth, international sample

| | (1) | (2) | (3) | (4) |
|--|---------------------|----------------------|---------------------|---------------------|
| | IMR | | | |
| local open defecation $X \ln(\text{density})$ | 3.273* (1.390) | 3.204* (1.360) | 2.271* (1.049) | 2.255* (1.041) |
| local open defecation $\ln(\text{density})$ | 26.37*** (2.347) | 26.39*** (2.325) | 12.69*** (2.245) | 12.57*** (2.223) |
| | -0.333 (0.645) | -0.344 (0.634) | 0.516 (0.518) | 0.528 (0.518) |
| household OD | 6.246*** (1.711) | 6.281*** (1.717) | 3.102** (1.049) | 3.068** (1.040) |
| mom's age at birth | | -0.473*** (0.109) | | -0.400* (0.182) |
| extended controls | | | ✓ | ✓ |
| country FEs | ✓ | ✓ | ✓ | ✓ |
| <i>n</i> | 1109116 | 1109116 | 942350 | 942350 |

Standard errors clustered by survey PSUs in parentheses. Two-sided *p*-values: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$.

Table S5: Results are robust to controlling for interaction of population density and other community-level infectious disease behaviors

| | (1) | (2) | (3) | (4) |
|--|---------------------|-----------------------|-----------------------|---------------------|
| local open defecation × $\ln(\text{density})$ | 3.244* (1.372) | 1.979* (0.905) | 2.180* (1.024) | 3.184+ (1.613) |
| local BCG vaccine × $\ln(\text{density})$ | | -4.932** (1.540) | | |
| local measles vaccine × $\ln(\text{density})$ | | | -2.448+ (1.310) | |
| local bed net use × $\ln(\text{density})$ | | | | -2.523 (2.048) |
| local open defecation | 11.625+ (6.218) | 6.326 (4.587) | 4.664 (5.142) | 0.258 (6.352) |
| local BCG vaccine | | -28.230*** (7.613) | | |
| local measles vaccine | | | -47.606*** (6.819) | |
| local bed net use ^a | | | | -5.982 (9.016) |
| $\ln(\text{density})$ | -1.468** (0.443) | 3.688* (1.393) | 1.004 (1.038) | -0.464 (1.075) |
| household OD | 6.165*** (1.739) | 5.960*** (1.664) | 5.887*** (1.634) | 5.126*** (1.167) |
| country fixed effect | ✓ | ✓ | ✓ | ✓ |
| <i>n</i> (live births) | 1087033 | 1080212 | 1080207 | 375236 |

Standard errors clustered by survey PSUs in parentheses. Two-sided p -values: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$. ^aFewer observations are included in column 4 because only certain African countries collected data on whether children under five slept under a bed net the night before the survey.