

Supplementary Information for

Analysis of Research Intensity on Infectious Diseases by Disease Burden: Which Infectious Diseases Are Neglected by Researchers?

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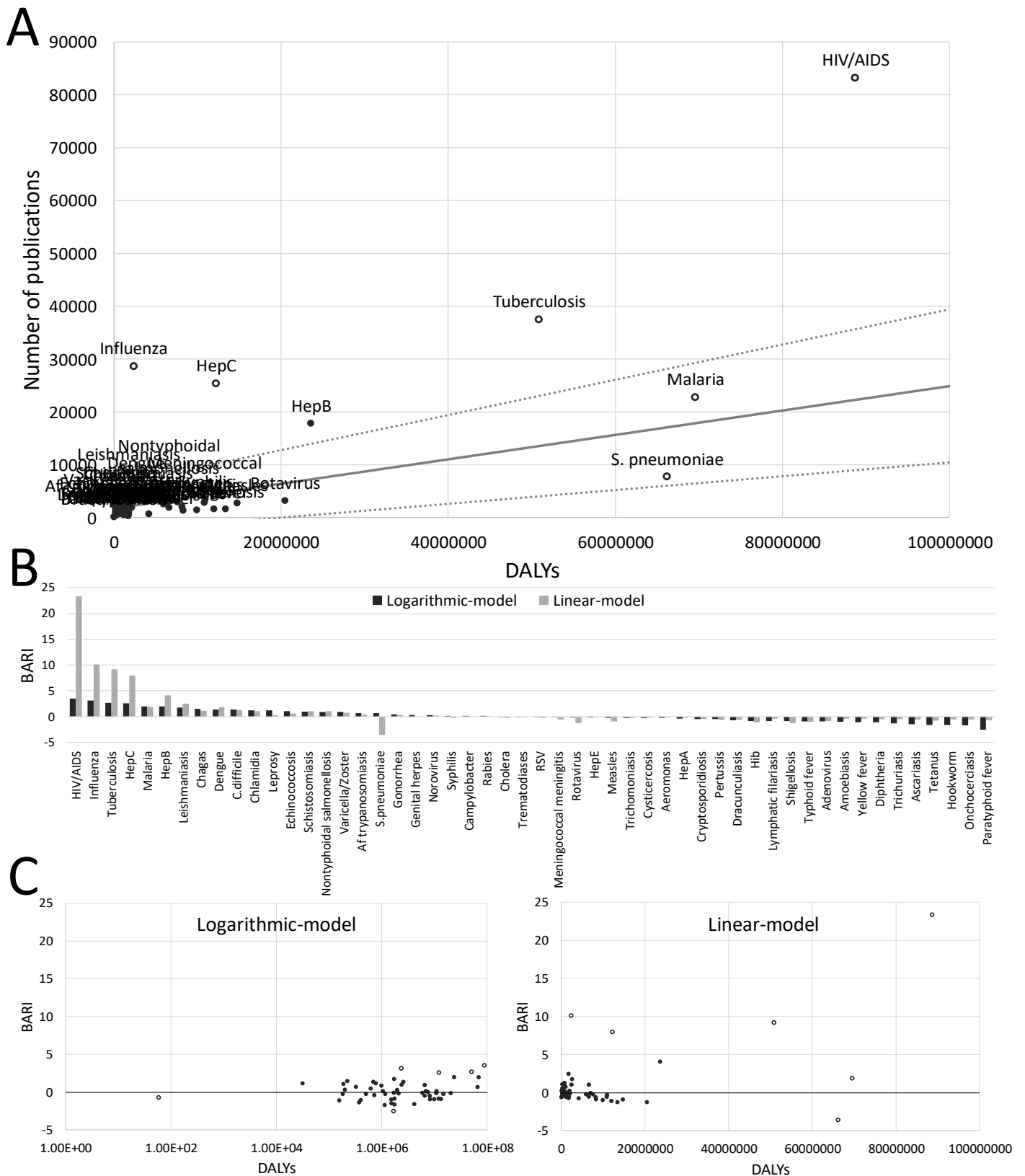


Fig. S1. Association between disease burden and research intensity under the assumption of a linear relationship between the two indicators. (A) Linear plot of disease burden (in DALYs) against research intensity (number of publications) for 52 infectious diseases at a global level in 2010–2017. The regression line and its 95% prediction interval were drawn. Diseases considered as outliers and excluded to draw the regression line are indicated by *open circles*. (B) Indices of burden-adjusted research intensity (BARI) for the 52 infectious diseases in the model assuming correlation in logarithmic scale and one assuming correlation in linear scale. (C) Plot of the BARI index by disease burden (DALYs) for each

infectious disease for the model assuming correlation in logarithmic scale (*left panel*) and one assuming correlation in linear scale (*right panel*).

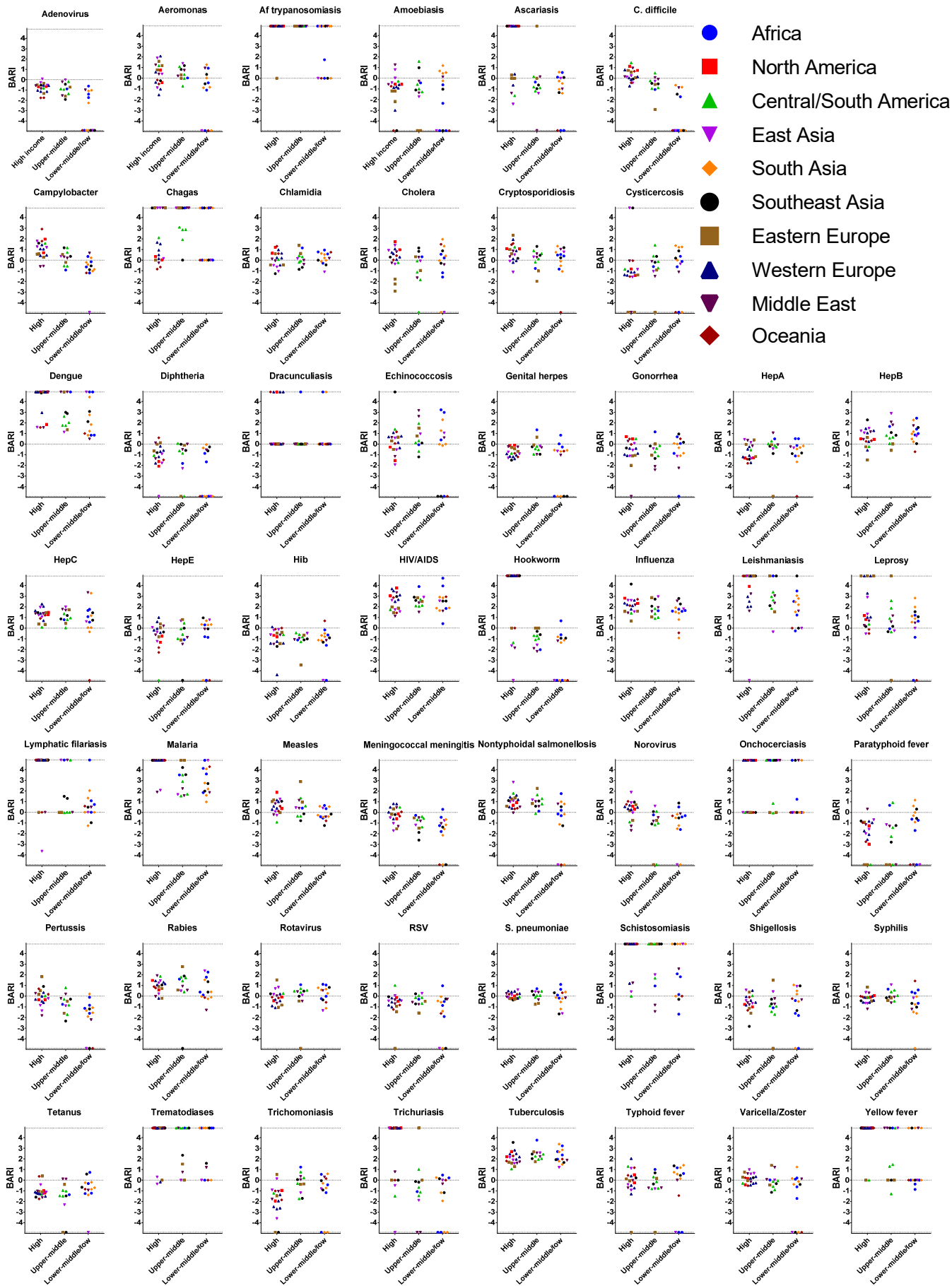


Fig. S2. The indices of burden-adjusted research intensity (BARI) at a country level by region and economic level for the 52 infectious diseases. When there is one or more publications about a disease which has no DALYs there, dots were plotted on the top horizontal broken line. When there is no publication about a disease which has no DALYs there, dots were plotted on the middle horizontal broken line. When there is no publication about a disease which has DALYs there, dots were plotted on the bottom horizontal broken line.

Table S1. Infectious diseases and their classification.

Disease	Label	MeSH used for search	Disease burden (DALYs)	Organism	Transmission	Vaccine available	Neglected tropical disease
Adenovirus infection	Adenovirus	"Adenoviruses, Human" OR "Adenovirus Infections, Human"	High	Virus	- ^{*1}	No	No
Aeromonas gastroenteritis	Aeromonas	"Aeromonas"	Middle	Bacterium	Enteric	No	No
African trypanosomiasis	Af trypanosomiasis	"Trypanosomiasis, African" OR "Trypanosoma brucei brucei" OR "Trypanosoma brucei gambiense" OR "Trypanosoma brucei rhodesiense"	Low	Parasite	Vector	No	Yes
Amoebiasis	Amoebiasis	"Dysentery, Amebic" OR "Entamoeba histolytica"	Middle	Parasite	Enteric	No	No
Ascariasis	Ascariasis	"Ascariasis" OR "Ascaris lumbricoides"	Middle	Parasite	Enteric	No	Yes
Pseudomembranous enterocolitis by Clostridium difficile	C.difficile	"Clostridium difficile" OR "Enterocolitis, Pseudomembranous"	Low	Bacterium	Enteric	No	No
Campylobacter enteritis	Campylobacter	"Campylobacter Infections" OR "Campylobacter"	High	Bacterium	Enteric	No	No
Chagas disease	Chagas	"Chagas Disease" OR "Trypanosoma cruzi"	Low	Parasite	Vector	No	Yes
Chlamydial infection including STD and trachoma	Chlamydia	"Chlamydia" OR "Chlamydia Infections" OR "Trachoma" OR "Chlamydia trachomatis"	Low	Bacterium	Sexual	No	Yes
Cholera	Cholera	"Cholera" OR "Vibrio cholerae"	High	Bacterium	Enteric	Yes	No
Cryptosporidiosis	Cryptosporidiosis	"Cryptosporidiosis" OR "Cryptosporidium"	Middle	Parasite	Enteric	No	No
Cysticercosis	Cysticercosis	"Cysticercosis" OR "Taenia solium"	Low	Parasite	Enteric	No	Yes
Dengue fever	Dengue	"Dengue" OR "Dengue Virus"	Middle	Virus	Vector	No	Yes
Diphtheria	Diphtheria	"Diphtheria" OR "Corynebacterium diphtheriae"	Low	Bacterium	Respiratory	Yes	No
Dracunculiasis (Guinea worm disease)	Dracunculiasis	"Dracunculiasis" OR "Dracunculus Nematode"	Low	Parasite	Enteric	No	Yes
Cystic echinococcosis	Echinococcosis	"Echinococcosis" OR "Echinococcus"	Low	Parasite	Environment	No	Yes
Genital herpes	Genital herpes	"Herpes Genitalis" OR "Herpesvirus 2, Human"	Low	Virus	Sexual	No	No
Gonococcal infection	Gonorrhea	"Gonorrhea" OR "Neisseria gonorrhoeae"	Low	Bacterium	Sexual	No	No
Acute hepatitis A	HepA	"Hepatitis A" OR "Hepatitis A virus"	Low	Virus	Enteric	Yes	No
Hepatitis B (acute and chronic hepatitis/cirrhosis/liver cancer)	HepB	"Hepatitis B" OR "Hepatitis B virus"	High	Virus	-	Yes	No
Hepatitis C (acute and chronic hepatitis/cirrhosis/liver cancer)	HepC	"Hepatitis C" OR "Hepacivirus"	High	Virus	-	No	No
Acute hepatitis E	HepE	"Hepatitis E" OR "Hepatitis E virus"	Middle	Virus	Enteric	No	No
H. influenzae type B meningitis and pneumonia	Hib	"Haemophilus influenzae type b" OR "Haemophilus Infections"	High	Bacterium	Respiratory	Yes	No
HIV/AIDS	HIV/AIDS	"HIV" OR "HIV Infections"	High	Virus	Sexual	No	No
Hookworm disease	Hookworm	"Hookworm Infections" OR "Ancylostoma"	Middle	Parasite	Environment	No	Yes
Influenza	Influenza	"Influenza, Human" OR "Influenzavirus A" OR "Influenzavirus B" OR "Influenzavirus C"	Middle	Virus	Respiratory	Yes	No
Leishmaniasis	Leishmaniasis	"Leishmaniasis" OR "Leishmania"	Middle	Parasite	Vector	No	Yes
Leprosy	Leprosy	"Leprosy" OR "Mycobacterium leprae"	Low	Bacterium	Respiratory	No	Yes
Lymphatic filariasis	Lymphatic filariasis	"Elephantiasis, Filarial" OR "Brugia" OR "Wuchereria bancrofti"	Middle	Parasite	Vector	No	Yes
Malaria	Malaria	"Malaria" OR "Plasmodium"	High	Parasite	Vector	No	No
Measles	Measles	"Measles" OR "Measles virus"	High	Virus	Respiratory	Yes	No
Meningococcal meningitis	Meningococcal meningitis	"Meningococcal Infections" OR "Neisseria meningitidis"	High	Bacterium	Respiratory	Yes	No
Salmonella infections other than typhoid/paratyphoid fevers	Non-typhoidal salmonellosis	"Salmonella Food Poisoning" OR "Salmonella enteritidis" OR "Salmonella typhimurium"	Middle	Bacterium	Enteric	No	No
Norovirus infection	Norovirus	"Norovirus" OR "Caliciviridae Infections"	Middle	Virus	Enteric	No	No
Onchocerciasis	Onchocerciasis	"Onchocerciasis" OR "Onchocerca"	Middle	Parasite	Vector	No	Yes
Paratyphoid fever	Paratyphoid fever	"Paratyphoid Fever" OR "Salmonella paratyphi A" OR "Salmonella paratyphi B" OR "Salmonella paratyphi C"	Middle	Bacterium	Enteric	No	No
Pertussis (whooping cough)	Pertussis	"Whooping Cough" OR "Bordetella pertussis"	High	Bacterium	Respiratory	Yes	No
Rabies	Rabies	"Rabies" OR "Rabies virus"	Low	Virus	Vector	Yes	Yes
Rotaviral enteritis	Rotavirus	"Rotavirus" OR "Rotavirus Infections"	High	Virus	Enteric	Yes	No
Respiratory syncytial virus infection	RSV	"Respiratory Syncytial Viruses" OR "Respiratory Syncytial Virus, Human"	Middle	Virus	Respiratory	No	No
Pneumococcal meningitis and pneumonia	S.pneumoniae	"Pneumococcal Infections" OR "Streptococcus pneumoniae"	High	Bacterium	Respiratory	Yes	No
Schistosomiasis	Schistosomiasis	"Schistosomiasis" OR "Schistosoma"	Middle	Parasite	Environment	No	Yes
Shigellosis (bacillary dysentery)	Shigellosis	"Dysentery, Bacillary" OR "Shigella"	High	Bacterium	Enteric	No	No
Syphilis	Syphilis	"Syphilis" OR "Treponema pallidum"	High	Bacterium	Sexual	No	No
Tetanus	Tetanus	"Tetanus" OR "Clostridium tetani"	Middle	Bacterium	Environment	Yes	No
Food-borne trematodiasis	Trematodiasis	"Clonorchiasis" OR "Opisthorchiasis" OR "Fascioliasis" OR "Paragonimiasis" OR "Clonorchis sinensis" OR "Opisthorchis" OR "Fasciola" OR "Paragonimus"	Middle	Parasite	Enteric	No	Yes
Trichomoniasis	Trichomoniasis	"Trichomonas Infections" OR "Trichomonas"	Low	Parasite	Sexual	No	No
Trichuriasis	Trichuriasis	"Trichuriasis" OR "Trichuris"	Low	Parasite	Enteric	No	Yes
Tuberculosis	Tuberculosis	"Tuberculosis" OR "Mycobacterium tuberculosis"	High	Bacterium	Respiratory	Yes	No
Typhoid fever	Typhoid fever	"Typhoid Fever" OR "Salmonella typhi"	High	Bacterium	Enteric	Yes	No
Varicella and herpes zoster	Varicella/Zoster	"Herpesvirus 3, Human" OR "Varicella Zoster Virus Infection"	Low	Virus	Respiratory	Yes	No
Yellow fever	Yellow fever	"Yellow Fever" OR "Yellow fever virus"	Low	Virus	Vector	Yes	No

*1 Not classified.

Table S2. Countries or territories included in the country-level analysis and their classification.

Country/territory	Region	Economy
Argentina	Central/South America	Upper-middle
Australia	Oceania	High
Bangladesh	South Asia	Lower-middle
Brazil	Central/South America	Upper-middle
Canada	North America	High
Chile	Central/South America	High
China	East Asia	Upper-middle
Colombia	Central/South America	Upper-middle
Croatia	Eastern Europe	Upper-middle
Czech Republic	Eastern Europe	High
Egypt	Middle East	Lower-middle
France	Western Europe	High
Germany	Western Europe	High
Hungary	Eastern Europe	High
India	South Asia	Lower-middle
Indonesia	Southeast Asia	Lower-middle
Iran	Middle East	Upper-middle
Israel	Middle East	High
Italy	Western Europe	High
Japan	East Asia	High
Kenya	Africa	Lower-middle
Malaysia	Southeast Asia	Upper-middle
Mexico	Central/South America	Upper-middle
Mongolia	East Asia	Lower-middle
Morocco	Africa	Lower-middle
Nepal	South Asia	Low
New Zealand	Oceania	High
Nigeria	Africa	Lower-middle
Pakistan	South Asia	Lower-middle
Papua New Guinea	Oceania	Lower-middle
Poland	Eastern Europe	High
Russia	Eastern Europe	Upper-middle
Saudi Arabia	Middle East	High
Singapore	Southeast Asia	High
South Africa	Africa	Upper-middle
South Korea	East Asia	High
Spain	Western Europe	High
Sri Lanka	South Asia	Lower-middle
Taiwan	East Asia	High
Thailand	Southeast Asia	Upper-middle
Tunisia	Africa	Lower-middle
Turkey	Middle East	Upper-middle
United Kingdom	West Europe	High
USA	North America	High
Vietnam	Southeast Asia	Lower-middle