



LITERATURE REVIEW IDEAS FOR THE EXPERIENCED RESEARCHER:

Exploring and analyzing findings and trends from the current body of research on a particular topic

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Conducting Literature Reviews

This document is intended for researchers who are familiar with searching for literature via Google Scholar, Scopus, or other databases, and retrieving, sorting through, and organizing that literature to either:

- Assess an evidence base;
- Identify research gaps; and/or
- Synthesize and document the base of existing knowledge so that the contribution of new work is evident.

For example, in 2015, EPAR conducted a literature review to answer the research question: “What is the evidence in the scholarly peer-reviewed literature of the effect of morbidity on economic growth?” We will provide examples from this review ([EPAR Technical Report #293](#)) to illustrate the steps in the literature review process as outlined below.

A literature review is the starting point of many research projects because it helps the researcher understand the existing body of evidence on a particular subject. While the required level of rigor depends on the intended use of the review, the goal is to have some level of certainty that you have identified the relevant literature, and that you are collecting from the literature the information necessary to rigorously evaluate the state of current knowledge relating to your research question(s).

To increase our confidence in the results of literature reviews, EPAR emphasizes three key components of the process: (i) building the sample of studies to review; (ii) developing a review framework and systematically extracting information from the sample of studies using a coding spreadsheet; and (iii) using the coding spreadsheet to help analyze the evidence base and present the results. *Figure 1* outlines the general steps that EPAR follows when conducting a literature review, organized according to these three key components.

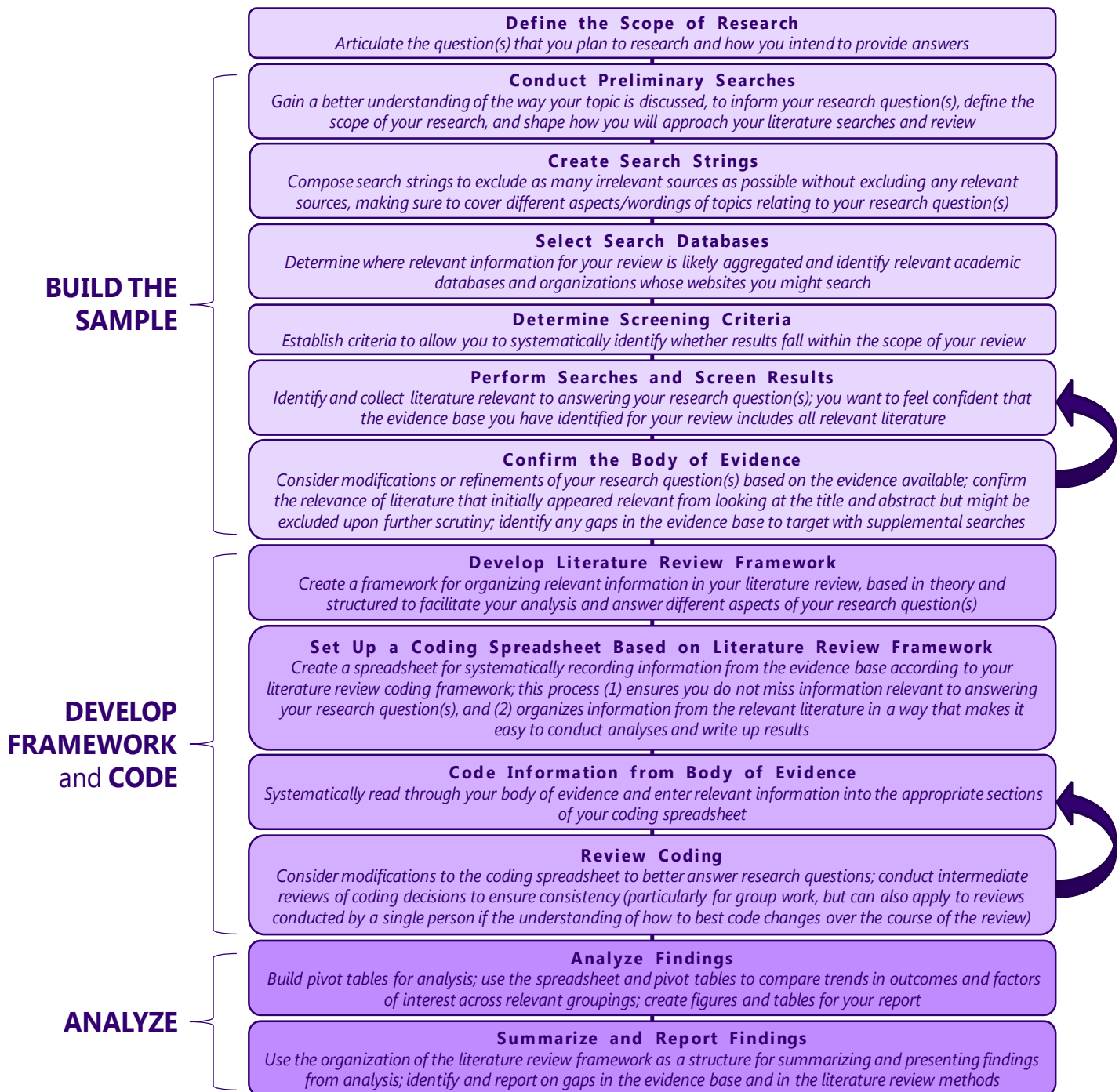
The intended results of a rigorous literature review are:

- Transparency around the scope of your research and your review methods;
- Confidence (among both the researchers and your audience) in your clearly defined body of evidence and the integrity of any findings you pull from it;
- Improved teamwork - with everyone following the same “system” in identifying, coding, and analyzing evidence;
- A spreadsheet of evidence from the literature coded according to a well-organized review framework, covering key aspects of the theory relevant to your research question(s); and
- A document presenting findings from your analysis (and relevant tables/graphics) that answers your research question(s) and identifies gaps in the evidence base (or in your review methods).

EPAR uses an innovative student-faculty team model to provide rigorous, applied research and analysis to international development stakeholders. Established in 2008, the EPAR model has since been emulated by other UW schools and programs to further enrich the international development community and enhance student learning.

Please direct comments or questions about this research to Principal Investigators Leigh Anderson and Travis Reynolds at epar.evans.uw@gmail.com.

Figure 1. Overview of the Literature Review Process



In the following sections we summarize how EPAR approaches these three key components, with examples from our literature review of morbidity and economic growth ([EPAR Technical Report #293](#)) to illustrate the various steps. An accompanying [slide deck](#) goes through all of the steps that EPAR takes in conducting a rigorous literature review in greater detail, and also includes key items to consider during the review and examples from previous EPAR literature reviews.

(i) Building the sample of studies to review

EPAR uses a five-part approach to the study search and screening process to ensure that we capture the studies relevant to our research question(s) (often refining our research question(s) as we go):

1. Conduct **preliminary searches** to better understand the relevant terminology, causal pathways, and theoretical linkages related to the research question(s)

E.g., What are the various measures of morbidity (such as DALYs) and of growth (such as GDP)? What are the hypothesized pathways between morbidity and growth, such as the effect of malnutrition on wages and productivity?

2. Experiment with a variety of search terms to **identify the search string(s) that seem most effective** (i.e., that increase the proportion of search results that are relevant to the review), and **identify relevant search databases**

In the case of our analysis of morbidity impacts on economic growth, we decided to only review academic peer-reviewed literature (though in other cases we have searched Google, Google Scholar, and selected organizations' websites for good unpublished literature). We used the Scopus academic database, supplemented by searches in Google Scholar. We chose Scopus because it is a multi-disciplinary academic database with useful tools for filtering search results and for exporting search results to a spreadsheet for documentation and screening.

We used Boolean search strings (with operators AND, OR, NOT, quotation marks "" that surround exact phrases to be searched, and parentheses () that combine terms and operators), based on each of the different measures of morbidity and keywords including economic growth: e.g. ("life expectancy" OR "years lived with disability") AND (GDP OR income OR "economic growth")

We initially put terms like "RCT" and "randomized control trial" and "experimental" in our search strings to try to focus on studies that might allow for causality to be assessed. So few studies emerged, however, that we included more general terms like "empirical" and expanded the acceptable methodologies to "quasi-experimental" in our search strings.

Initial Scopus searches using broad keywords such as "health" and "disease" alongside economic growth indicators returned 7,331 results for "health" and economic growth, and 2,231 results for "disease" and economic growth. A narrower search using specific morbidity search terms returned 3,948 items of published literature across multiple searches. For example, one search focusing on DALYs as a measure of morbidity used the following search string: ("Disability Adjusted Life Years" OR DALY) AND ("economic growth" OR GDP OR GNI OR wage* OR income* OR productiv*)*

3. Conduct further **targeted supplemental searches** to make sure we have not missed anything (e.g., searches on Google Scholar restricted to the last 2 years, searches using terms related to any gaps in the evidence identified from initial searches)

We conducted supplementary searches using Google Scholar to identify any well-cited literature that may have been missed through the Scopus keywords. These searches yielded an additional 106 studies that seemed relevant from an initial screening of the title and abstract, which were narrowed down to 43 relevant empirical studies upon further screening.

4. **Screen search results for relevance** to the research question(s) and **confirm the body of evidence** (population of studies) for the review, using criteria tailored to the research question(s) and research scope

Manually reviewing our search results for relevance based on titles, keywords, and abstracts resulted in a refined sample of 673 empirical studies of the links between morbidity and economic growth. After a further review of the text of these studies, we identified 341 that focused on household-, firm-, or economy-level pathways from our selected morbidity focus areas to economic growth.

If the result is too many seemingly relevant documents to review, additional common screening criteria include:

- Year of publication (i.e., filtering out older papers);
- Number of citations;
- Study methodology (i.e. experimental, quasi-experimental, etc.); or
- Focus on subpopulations of interest (i.e., by geography, gender, income level, age).

These various criteria (year of publication, geography, methodology, etc.) can be used to narrow searches in the search strings, or as screening criteria for the studies you surface. Be sure if you narrow to a subpopulation that you don't discard information from the broader group that helps you to construct a comparative. If you find a set of studies reporting outcomes for youth, for example, and there are no studies reporting outcomes for adults included in your evidence base, the findings from your review would be specific to youth and may not be more broadly generalizable.

In our research question we specifically state that we are analyzing morbidity's "impact on" growth, rather than just morbidity's "association with" growth. We therefore prioritize evidence from experimental studies (e.g., randomized controlled trials) and large-N analyses for our review.

5. **Carefully document and report all aspects of the search process** (search locations, search strings, screening criteria, and screening of search results) for transparency and to increase confidence in our search methods

Our review of morbidity and economic growth includes a methods section and description of our body of evidence, and all keyword search terms and summary search results are provided in Appendix 2 of the [full report](#). Consider keeping a list of any filtered out but potentially relevant papers that you can note for the reader (e.g., "first-cut" papers in the screen shot below that met our screening criteria but were not prioritized for review after the "second-cut").

The table below is from Appendix 2 of the report, and provides an overview of the search and screening process in Scopus (the full Appendix includes further search and screening information). The keywords in the table are not full search strings - each search included the listed terms along with the overarching keywords "AND ("economic growth" OR GDP OR GNI OR wage OR income* OR productiv*)".*

Table A2.1: Scopus Keyword and search results

Keywords searched	Total Number of Search Results	First-cut				Second-cut	
		Relevant Studies	Relevant and Empirical Studies	Relevant, Empirical and Individual/HH/ Firm level Studies	Relevant, Empirical and Economy level Studies	Relevant, Empirical and Individual/H H/Firm level Studies - Morbidity Focus Areas	Relevant, Empirical and Economy level Studies - Morbidity Focus Areas
morbidity*	326	104	87	47	44	23	34
health*	7331						
disease*	2213						
Tuberculosis	99	16	15	8	7	4	3
rotavirus	29	13	12	11	1	1	
malaria	109	27	19	9	14	7	11
polio	5	0	0	0	0		
HIV*	309	79	71	32	47	11	29
"disease index"	0	0	0	0	0		
"life expectancy"	572	60	39	6	33		
"self reported health" OR "self assessed health"	25	8	7	6	1		
"Healthy life expectancy" OR HALE*	10	0	0	0	0		
"Disability Adjusted Life Years" OR DALY*	84	38	37	32	5	4	5
"Quality adjusted life year" OR QALY*	119	69	69	66	3	12	2
"Years of Life Lost" OR YLL*	11	4	4	0	4		4
"Years Lived with Disability" OR YLD*	2	1	1	0	1		1
comorbidity* OR co-morbidity* OR comorbid*	85	28	27	23	4	12	4
"Charlson comorbidity index"	4	2	2	2	0	2	
nutrition*	728	66	50	43	8	25	3
"weight-for-age" OR "stature-for-age" OR height OR (weight AND height)	226	33	32	28	5	25	
"weight-for-recumbent length" OR "head circumference"	4	0	0	0	0		3
BMI	92	26	26	25	1	21	
stunted OR stunting OR wasting	66	4	4	3	1	3	
"iron deficiency"	12	7	6	5	1	2	1
"calorie intake" OR calori*	156	16	13	11	2	8	1
cogniti*	397	92	62	47	22	26	15
IQ	65	29	17	4	14	4	12
"mental health" OR "Patient health questionnaire" OR "Generalized Anxiety Disorder"	291	38	37	31	7	17	6
vaccinati*	112	36	32	28	4		
TOTAL	13492	796	673	467	229	207	134

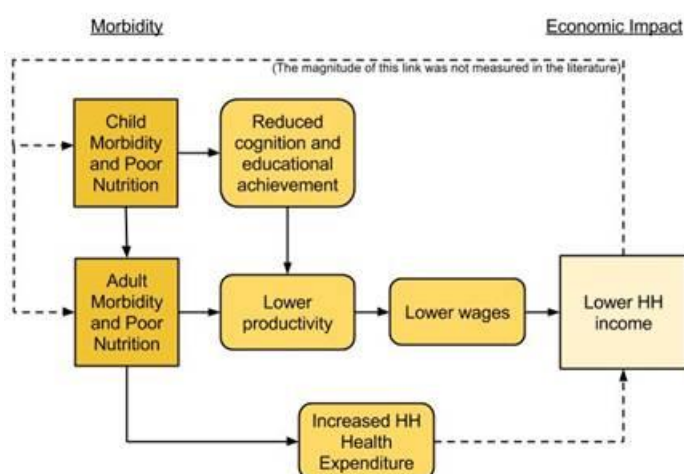
Note: The light grey shaded cells represent the keywords that were used but they were not coded; the dark-grey shaded cells were not part of the morbidity focus area defined in Section VI.

Note: The first-cut refers to the initial level of coding done using the title, keywords and abstract. The second cut refers to the second level of coding done using the text of the studies.

(ii) Developing a review framework and systematically extracting information from the sample of studies using a coding spreadsheet

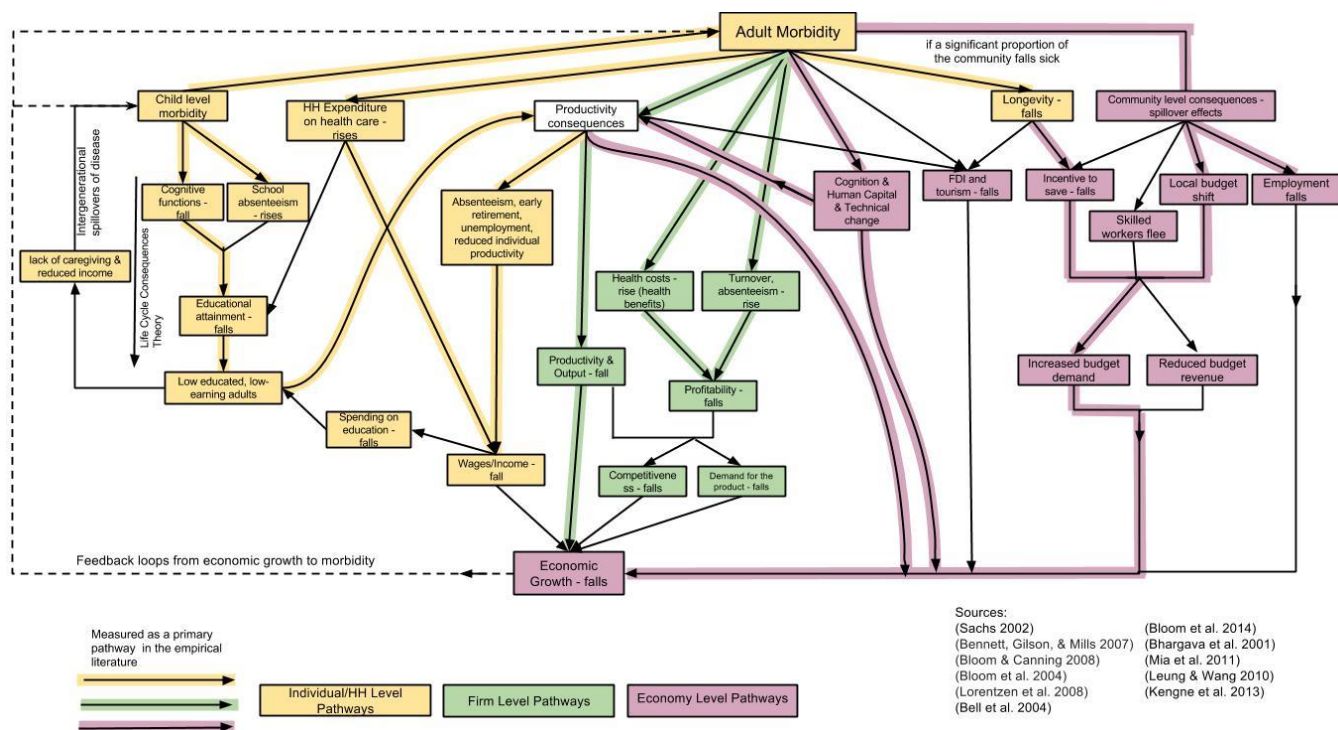
Answering a research question requires having some idea (hypothesis) based on a theory of the causal relationship between an outcome and the factors that drive or are associated with those outcomes. If the research question is not causal in nature, but instead is just asking for evidence of associations among variables, some underlying theory still explains why an association is expected even if the direction of causality is unknown. EPAR begins by writing out a review framework informed by the theory and preliminary searches in Part 1, and that outlines the specific information we aim to collect from the studies (the outcomes of interest, the hypothesized drivers of or barriers to these outcomes, potential “co-variates”, and important “controls” like study geography, date, methodology, etc.).

For example, as shown below, child morbidity may result in greater school absenteeism and reduced educational attainment, resulting in lower adult productivity with implications for reduced household income. This pathway might further draw a connection from lower adult productivity to reduced economic output and lower economic growth, at the economy-level.



There are multiple, complex causal pathways from morbidity to economic growth but all are fundamentally through disease or disability reducing productivity (lost income, or compromised physical or cognitive inputs that decrease firm outputs) or expenditures diverted from investment to health care. We built from individual pathways such as for child morbidity above to represent the multiple pathways theorized via three different avenues and pictured below:

- **Individual/HH-level pathways**, e.g., the direct loss of wellbeing to an individual as the result of disease, life cycle consequences of illness and disability, and intergenerational spillovers of disease
- **Firm-level pathways**, e.g., high turnover in the workforce, combined productivity losses of sick individuals, and the cumulative impact of disease amplified by the repeated need to reassign and train new workers
- **Economy-level pathways**, e.g., when a significant proportion of people in a country or region fall ill there are spillover effects on the entire country/region, such as falling savings rates



The review framework for our review of morbidity to economic growth includes both the measures of morbidity and economic growth used in our sample of studies as well as the various pathways we identified. We included each measure and pathway in our review framework, to be able to code yes or no for whether each study discussed that measure or pathway.

Developing a review framework makes the research question, goals, and causal pathways explicit. This is particularly important if the literature review aims to answer “why” certain outcomes are observed or to explain differences in outcomes across contexts or studies. Usually, an initial review framework is developed prior to the literature searching and screening, based on theoretical expectations and preliminary searches. The review framework may be updated after the searches and screening, however, based on new information observed during that process. The framework can also be refined during the review as we identify new, relevant information that would be valuable to include in the analysis.

After we have identified our sample of studies to review, we create a spreadsheet structured according to the review framework in order to systematically code information from the studies for analysis. Our “framework” is broken into columns containing questions related to the relevant outcome measures or co-variables, aspects of causal pathways, and findings, along with study descriptors (year, geography, participant population, etc.). The specific columns vary depending on the nature of the review and the research question.

In our review of the evidence on the impacts of morbidity on economic growth, our columns separate important distinctions in the measures of morbidity and economic growth used in the study. So, each measure (life-expectancy, stunting, etc.) would have a different column, grouped under “morbidity measures,” and would be coded according to which indicator the study used:

- *Measures of morbidity include direct measures (e.g., life expectancy, self-reported health), disability adjusted health metrics, nutritional measures, and cognition*

- *Measures of economic impact includes GDP or GNP measures, household income or average income, FDI, wages, productivity, absenteeism, employment, savings, and education/human capital*

Other columns distinguish the pathway discussed in the study (individual, household, firm, or economy-wide) and the mechanisms assumed within that pathway developed in the review framework (e.g. wages, absenteeism, turnover).

Each column in the coding spreadsheet is usually worded as a yes/no or categorical question (to allow for simple comparisons across studies and creating pivot tables and visualizations) capturing some aspect of the review framework. Each of these columns is accompanied by a “describe” column where coders include supportive qualitative information to justify the coding decision and provide additional context. “Describe” columns provide useful qualitative information that can be used to supplement tables and figures in the analysis and in writing up findings from the literature review.

Example coding (column heading followed by what is entered in the cell for that study/row) for the evidence on the impacts of morbidity on economic growth

- “Number of countries included in the study”: 1
- “Country (specify country name, or “multiple” if more than one)”: Tanzania
 - An associated “Describe” column could include the names of multiple countries when there are more than one, or information about the included country, such as “Rural areas in Northern Zone and Lake Zone only”.
- “Sub-Saharan Africa? Y/N”: Y
- “Impact on nutrition (positive, negative, mixed, not significant)”: positive
 - An associated “Describe” column would include more detail, such as “.3% increase in school absences associated with 1% decrease in measures of wasting”

The figure below presents a section of our coding spreadsheet for the review of morbidity and economic growth as an example. The [full coding spreadsheet](#) is available on our website.

			MEASURES OF MORBIDITY		MEASURES OF ECONOMIC IMPACT					GEOGRAPHY
			Direct Measures							
Keyword	Authors	Title	Disease-specific (what disease?)	Disease-specific (/1)	GDP or GNP measures	Household income or average income	Wages	Productivity, absenteeism, employment, etc	Other (specify)	Where? (Geography/Country)
comorbidity	Libby A.M., Ghu	Economic differences in direct and indirect costs bet	epilepsy	1			1	1		United States
comorbidity	Jung D., Bhatta	Association of hearing loss with decreased employm	hearing loss	1			1			United States
comorbidity	Kruse M., Saett	Particulate emissions: Health effects and labour map	pollution-related	1				1		Denmark
comorbidity	Fu A.Z., Chen L.	Absenteeism and short-term disability associated w	breast cancer	1				1		United States
comorbidity	Sullivan P.W., C	Influence of rheumatoid arthritis on employment, fu	arthritis	1			1	1		United States
comorbidity	Fu A.Z., Qiu Y.,	Health care and productivity costs associated with di	diabetes	1				1		United States
comorbidity	Jofre-Bonet M.	Poor mental health and smoking: Interactive impact o	n wages				1			United States
comorbidity	Bell B., Chalkli	Burden of dysthymia and comorbid illness in adults	dysthymia	1			1			Canada
comorbidity	Birnbaum H.G.	Direct and indirect costs of asthma to an employer	asthma	1				1		United States
Disability Adj	Rao P.S., Darlo	Disability adjusted working life years (DAWLs) of le	leprosy	1			1	1		India
Disability Adj	Sharieff W., Ho	Economic gains of a home fortification program: Eval	diarrhea	1			1			Pakistan
HIV	Marinescu I.	HIV, wages, and the skill premium	HIV/AIDS	1			1			sub-Saharan Africa
HIV	Chicoine L.	AIDS mortality and its effect on the labor market: Evi	HIV/AIDS	1			1	1		South Africa
HIV	Olang'O C.O., N	Children as caregivers of older relatives living with H	HIV/AIDS	1						Kenya
HIV	Pennap G.R.I.,	A review of the impact of HIV/AIDS on education, the	HIV/AIDS	1				1 firm costs		multiple countries in Africa
HIV	Collins D.L., Le	The financial impact of HIV/AIDS on poor households	HIV/AIDS	1		1		HH costs		South Africa
HIV	Dorward A.R., M	Labor market and wage impacts of HIV/AIDS in rural	HIV/AIDS	1				1		Malawi
HIV	Rosen S., Vince	The cost of HIV/AIDS to businesses in southern Africa	HIV/AIDS	1				1 firm costs		multiple countries in Africa
HIV	Rosen S., Simo	AIDS Is Your Business	HIV/AIDS	1				firm costs		South Africa, Botswana
HIV	Fraser F.K., Gra	The impact of HIV/AIDS on small and medium enterp	HIV/AIDS	1				1 firm costs		South Africa

In our coding spreadsheet, we coded information from each of the retrieved studies. We first captured basic document characteristics such as the author(s), title, abstract, geography, research design (experimental and quasi-experimental studies, meta-analyses and systematic reviews), etc. The spreadsheet further included information for each study on measures of morbidity and measures of economic impact, as outlined in the review framework, with yes/no entries coded as 1/0 to facilitate analysis with pivot tables and adjacent cells to provide qualitative descriptions (not shown in the above figure). Finally, for each study, we coded information on the specific pathways analyzed as connecting morbidity to economic growth.

We usually code one study per row (as in the review morbidity and economic growth), but if we want to compare across countries, programs, or products, we may aggregate information from multiple studies discussing a given country, program, or product into a single row. For example, the coding spreadsheet for EPAR’s review of land tenure technologies ([EPAR Technical Report #357](#)) aggregates information from multiple studies into rows where the unit of analysis was a specific technology, and the coding spreadsheet for EPAR’s review of digital financial services consumer protection regulations in developing countries ([EPAR Technical Report #324](#)) aggregates information from multiple studies into rows where the unit of analysis was an individual country. The coding spreadsheets for each of these projects are available on the respective project webpages.

(iii) Using the coding spreadsheet to analyze the sample of studies

A coding spreadsheet organizes the information from a literature review into tabular form (rows, columns and cells). EPAR primarily uses Excel for our coding spreadsheets. The basic “Sort & Filter” option in Excel allows you some flexibility for looking at your data in different ways. But PivotTables and PivotCharts (under the “Insert” option of the Excel main menu) allow you to do more, and in particular they facilitate grouping and summarizing the raw data from the coding spreadsheet¹.

To generate a pivot table, select all of your coded data (including headings²) and choose “PivotTable” from the Insert menu. Click inside the pivot table that is generated (usually on a new sheet) and the “PivotTable Fields” dialogue box will appear allowing you to choose your which column labels, row labels, cell values, and filters will appear in the pivot table. You can create multiple pivot tales depending on how you want the data summarized and displayed. A Microsoft Office guide to creating pivot tables from Excel spreadsheets can be found [here](#).

In our review of the evidence on morbidity and economic growth, we used the information coded in the spreadsheet to create the pivot table shown below. We coded, by country, according to whether the study presented quasi-experimental evidence, non-experimental evidence, or was a review. In the coding review framework, a column (field) for study type can be coded using consistent language (e.g., “quasi-experimental”) or with multiple columns for each study type, coding a 1 if it is true and 0 otherwise (sometimes followed by a “describe” column if text providing context is important). The pivot table then “sums” up the studies by type.

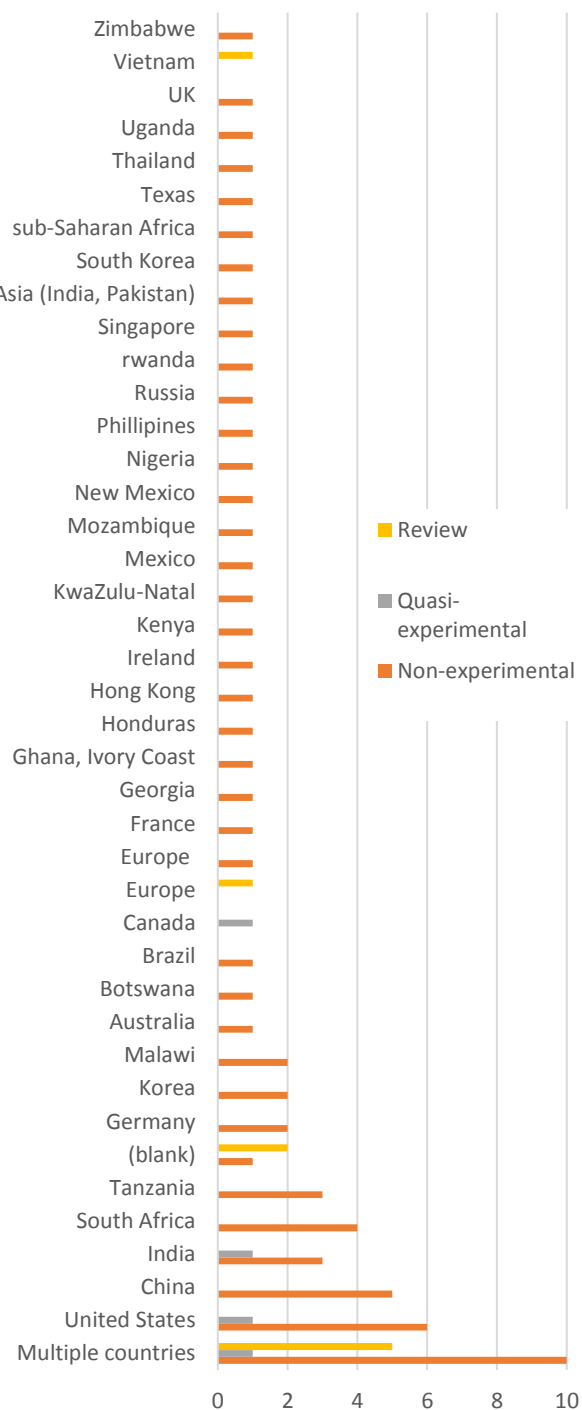
Once you have created a pivot table, you can simply click on a cell in the table and then select the PivotChart option (also under the “Insert” top menu option in Excel) and choose from bar or line graphs, pie charts, etc. Once you select your graphic and hit “OK”, it will appear on the same spreadsheet tab as the pivot table and can be copied and moved to your report (like the bar chart below).

¹ If you click on any cell in your coding data and select “Recommended PivotTables” the program will arrange your data, most likely with columns (called fields) containing numbers as the “values” (you need at least one field of numeric data like income, or non-numeric categorical data translated into counts of Yes = 1, No = 0, Female = 1, Male = 0, etc.), fields containing dates, times, or months selected as the “columns” and fields containing non-numeric data like livelihood or disease name selected as table rows.

Note: When creating pivot tables, be wary of cell values not making sense, for example, if you numbered a column of study/document IDs with 1, 2, 3, 4, etc.. In this case, the number doesn’t have meaning as a number itself, only as a label.

² Before creating a pivot table from your raw coding data, make sure you have just one row of headings/column labels selected along with your data.

	Non-experimental	Quasi-experimental	Review	Grand Total
Multiple countries	10	1	5	39
United States	6	1		7
China	5			5
India	3	1		4
South Africa	4			4
Tanzania	3			3
(blank)	1		2	3
Germany	2			2
Korea	2			2
Malawi	2			2
Australia	1			1
Botswana	1			1
Brazil	1			1
Canada		1		1
Europe			1	1
Europe	1			1
France	1			1
Georgia	1			1
Ghana, Ivory Coast	1			1
Honduras	1			1
Hong Kong	1	1		1
Ireland	1			1
Kenya	1			1
KwaZulu-Natal	1			1
Mexico	1			1
Mozambique	1			1
New Mexico	1			1
Nigeria	1			1
Phillipines	1			1
Russia	1			1
rwanda	1			1
Singapore	1			1
South Asia (India, Pakistan)	1			1
South Korea	1			1
sub-Saharan Africa	1			1
Texas	1			1
Thailand	1			1
Uganda	1			1
UK	1			1
Vietnam			1	1
Zimbabwe	1			1
Grand Total	89	4	9	102



These spreadsheets, in addition to being able to summarize and graph the data in a spreadsheet package, like Excel, Sheets, or Google Sheets, can be read into more specialized statistical packages like Stata or multi-purpose packages like R (sometimes importing these data or spreadsheets into other programs requires you to save your spreadsheet as a .csv or “comma-separated values” file). Statistical packages are generally preferred to spreadsheet packages for running any type of multivariate models and tests (e.g., OLS or probit).

Spreadsheets can also be imported into visualization software programs such as Tableau or Power BI to create dynamic visualizations of your data and coding. This is helpful for seeing patterns in your data, and especially useful for visualizing results of a literature review that includes many yes/no or categorical questions in the coding framework. [Tableau Desktop](#) offers a free one-year subscription for educational purposes, though you need to register and request a personal product key for the software, and a variety of useful training videos [here](#). After creating a Tableau visualization using the Tableau Desktop software, you can upload your visualization to [Tableau Public](#) (free to use after registering) to share with others or embed into a web page. [Power BI Desktop](#) can be downloaded for free, and similarly allows users to create an interactive visualization dashboard and publish it to the web. The [Power BI website](#) provides a variety of videos, samples, and in-depth documentation to support users in learning about the software.

A complete literature review output (often a report) will include (i) an introduction with background and a discussion of the theoretical underpinnings which informed the literature review framework, (ii) a transparent overview of the search, screening, and coding methods, (iii) tables and figures summarizing and presenting the findings, accompanied with relevant text providing further interpretation and analysis, and (iv) a discussion of the relevance of the findings to the research question(s) and any research gaps. Depending on your audience, you may want to include an Executive Summary at the beginning.

In addition to the [results coding spreadsheet](#) and the pivot tables used during analysis, EPAR prepared a [report](#) summarizing our findings. Key findings were reported in the following categories:

- *Measures of Morbidity*
- *Measures of Economic Growth*
- *Links between Morbidity and Economic Growth*
- *Findings: Literature on Morbidity and Growth*
- *Pathways from Morbidity to Growth: Individual/Household and Firm Level*
- *Pathways from Morbidity to Growth: Economy Level*
- *Conclusions and Research Gaps*