Health Policy and Systems Research
More than twenty years and looking forward

Background

Health policy and systems research (HPSR) is an emerging field that seeks to understand and improve how societies organize themselves in achieving collective health goals, and how different actors interact in the policy and implementation processes to contribute to policy outcomes.[1]

By nature, it is broad and inter-disciplinary, a blend of economics, sociology, anthropology, political science, public health and epidemiology that together draw a comprehensive picture of how health systems respond and adapt to health policies, and how health policies can shape – and be shaped by – health systems and the broader determinants of health.[2] It is not limited by discipline but its relevance is determined by the questions it addresses.

The 2004 Mexico Declaration from the Ministerial Summit on Health Research, and subsequent World Health Assembly resolutions, proposed a concerted global programme of work to support the development of HPSR. This included coordination across partners and advocates for the field of HPSR to monitor the development of the field, while promoting decision-making power and implementing responsibilities in low- and middle-income countries (LMIC).[3] The objectives were to ensure investment and good management of quality research to improve the health of the world's most marginalized people, with emphasis on how to best translate that knowledge to achieve improved public health.[4]

HPSR facilitates getting important issues onto the policy agenda. This process often involves extensive evaluation to learn from previously implemented policies. The commitment to promote local participation in the design and implementation of national development programs has shifted the development of policy and practice.[5] Development policies informed from the community level are known to lead to more sustainable national development and improved health outcome for the population.[6][7] HPSR advocates this philosophy through meaningful participation at the local level. Local expertise can efficiently identify practical and effective solutions to local problems, particularly for assisting vulnerable groups. These insights integrate into national economic, social and political processes in order to ensure sustainable benefit to the population. Contribution to this process can be demonstrated by local participation in HPSR literature production relevant to LMICs.

A previous World Health Report noted the "importance of long-term investment in the research institutions that generate evidence for policy".[8][9] The Alliance for Health Policy and Systems Research is celebrating its 20th anniversary. During these last two decades, the contribution to Health Policy and Systems Research literature has increased rapidly. This is an opportunity to take stock of the progress that has been made over the last 20+ years, reflect on

how this progress was made, and on how we improve.

For the purpose of this work, health policy and systems research is defined as research on the health system functions of regulation, organization, financing and delivery of services, as well as broader determinants (such as social and economic policies directly affecting the health system).[10] It focuses primarily upon the more upstream aspects of health, organizations and policies, rather than clinical or preventive services or basic scientific research (for example into cell or molecular structures).[11]

Health systems are extremely complex, with many interacting components that affect and influence each other in different ways over time. These interactions often have both anticipated and unexpected outcomes which creates a chain reaction within the system. Some components of the system may be well understood, while others require great sensitivity analysis. This process of interaction and influence continues its evolution over time. Using components of complexity science allows us to analyze the components quantitatively.

Bibliometric Analysis

At this milestone in HPSR history, evaluation and reflection of the contribution is captured through a variety of quantitative analysis. A bibliometric analysis is one type of quantitative analysis used to examine the production of academic literature over time. It is used to assess the "impact" of a field, researcher(s), or a particular paper over time.

Methods

Databases

PubMed was selected as the database to analyze health policy and systems research. While it has fewer publication overall than Web of Science, it has approximately <u>twice</u> as many *health policy* publications.

Search Strategy

There are 5 components for the search strategy. A high level search strategy was defined, suitable for the multi-decade timescale of a bibliometric and network analysis. Given keywords, terms and topics may trend over time, the high-level keywords selected were ubiquitous and consistent.

Health policy and systems research focuses primarily upon policies, organizations and programmes, but does not address clinical management of patients or basic scientific research (for example, cellular or molecular structures).[12]

Defining Health Policy and Systems Research

To ensure inclusivity of publications related to HPSR, a high-level keyword search strategy was applied. This strategy assumes that publications related to HPSR would, at the very least, have the words **health AND policy OR "health system(s)"** somewhere within the entire text of the publication. Once these publications were identified, additional keywords *could* be included to refine the definition.

The syntax (**health AND policy**) implies both terms are required in a single paper for inclusion. Alternatively, if a paper had the specific term **"health system*"** either independently or in combination with (health AND policy), it was also eligible for inclusion. Applying the asterisk implies all potential variants extending from the expression shall also be included, such as "health systems".

In the literature, disciplinary *inclusion* can be broad while *exclusion* is more well-defined. PubMed includes a defined set of filters to identify specific topics related to clinical queries and medical genetics.[13] The exclusion criteria *can* be applied to the search strategy using the Boolean operator, "NOT" thereby removing the irrelevant clinical literature.[14]

The *species* filter was applied to restrict the results to human studies.[15]

Relevance to LMIC

WHO plays a prominent role to advance research that addresses the dominant health needs of its Member States, to support national health research systems, to set norms and standards for

the proper conduct of research, and to accelerate the translation of research findings into health policy and practice.[16] One of the main tenants of HPSR is to promote decision-making power and implementation responsibilities <u>within</u> low- and middle-income countries. [17] [18] [19]

LMIC generally refers to the 135 countries within the 3 sub-classifications that represent **low-, or middle-income countries**, inclusive of all low-income countries (LIC) n=31, lower-middle-income (LowerMIC) n=51 and upper-middle income countries (UpperMIC) n=53. These countries were classified by the World Bank for the fiscal year 2016. This analysis also includes a variety of synonyms for "developing country".

Some analysis may refer to "LMIC" which implies any of the 135 countries and/or 3 sub-classifications. While other analysis differentiate between each of these classifications, by referring to the specific country's economic classification (i.e. authors from lower-middle income countries (LowerMIC)).

This analysis identifies the collection of papers with its main topic focused on an issue relevant to a LMIC (referred to in the figures as "LMIC Topic"). The title and abstract sections, denoted by the tag "Title/Abstract [TIAB]", are intended to most concisely describe the main focus and purpose of a paper. Therefore, these papers can be efficiently identified by limiting the search to the list of 135 LIC, LowerMIC and UpperMIC countries and synonyms for "developing country" that appear in the title and abstract.[20] This strategy is used in combination with the keyword search strategy.

LMIC Authors

These analyses are designed to help our understanding of the extent to which low- or middle-income countries participate meaningfully in the Health Policy and Systems Research that is meant to support decision making capacity in their countries. Identifying lead authors from LMIC is one means to determine participation, frequency of publication and connectedness of their co-authorship networks over time are used as the metrics.
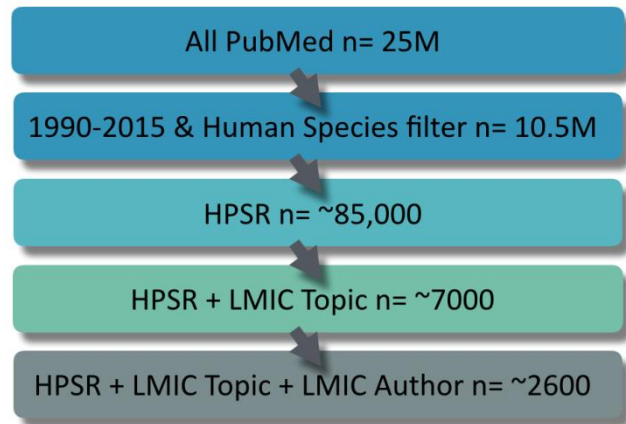
To identify authors from low- and middle- income countries, a combination of each of the 135 LMIC was used with PubMed's advanced search field builder [Affiliation]. An "LMIC Author" was defined as a first author whose institutional affiliation/address included an LMIC, this address was used as a proxy for country of residence.

Analysis Over Time

A publication date filter was used to restrict the studies to each and all years inclusive of January 1, 1999 to December 31, 2015. The range of years is meant to span beyond the duration of the Alliance for HPSR 20-year anniversary to also include a baseline prior to its inception.

Results

PubMed is comprised of more than 25 million papers; almost 16.7 million of which were published between January 1, 1990 and December 31, 2015, and 10.5 million remain for the same time period once the human species filter is applied. This latter group represents the baseline for this analysis and is used to show the general increase in publications for the specified time period.

All PubMed n= 25M

1990-2015 & Human Species filter n= 10.5M

HPSR n= ~85,000

HPSR + LMIC Topic n= ~7000

HPSR + LMIC Topic + LMIC Author n= ~2600

Since we know publications overall are increasing, we would like to understand whether the pace of publication among HPSR papers, with a topic focused on an LMIC and lead authorship from an LMIC is underperforming, on par, or outpacing life and health sciences in general.

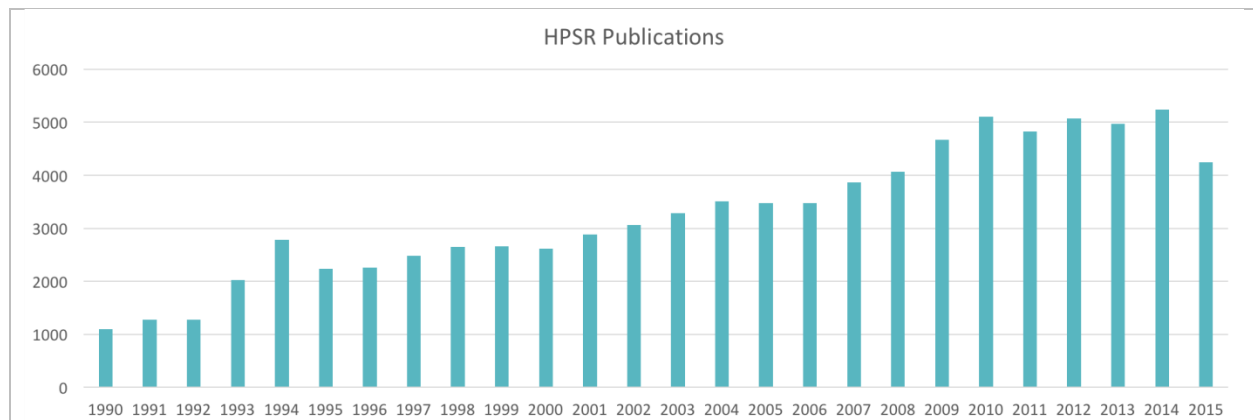## Number of HPSR Publications in PubMed from 1990-2015

Figure 1: Annual distribution of the number of HPSR publications in PubMed from 1990 - 2015 (N=~85,000).
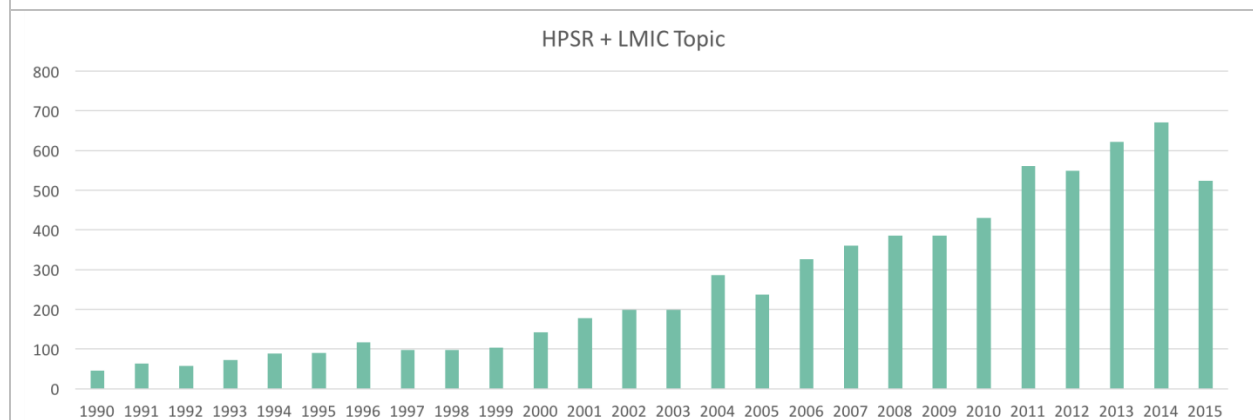

Figure 2: Annual distribution of the number of HPSR publications in PubMed that focus on a topic relevant to LMIC from 1990 - 2015 (N=~6,900).
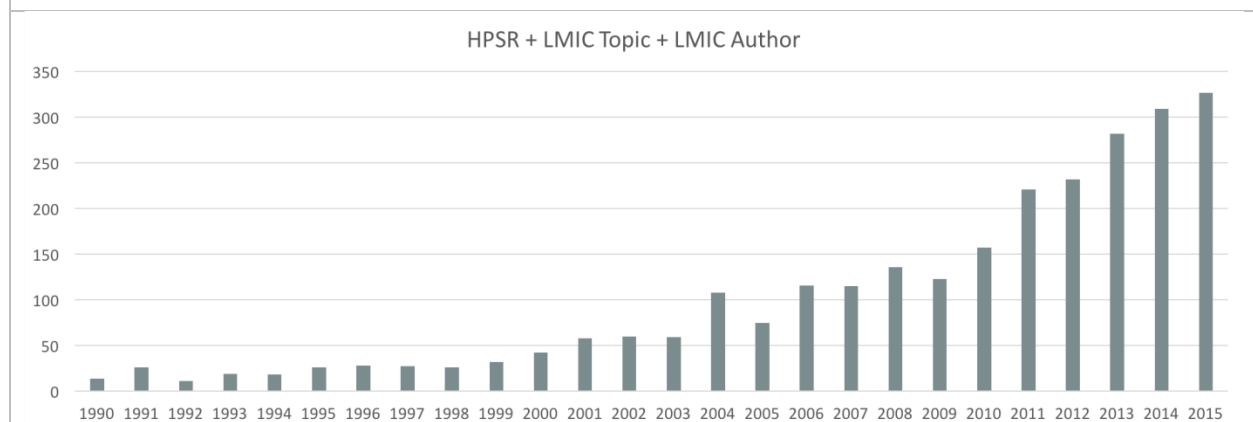

Figure 3: Annual distribution of the number of HPSR publications in PubMed that focus on a topic relevant to LMIC and have a lead author from an LMIC from 1990 - 2015 (N=~2,600).

These figures demonstrate the trend, in terms of absolute number, of HPSR and its sub-categories over time. All three categories have been increasing since 1990. It is worth noting the increase in HPSR publications (Figure 1) in the mid-1990's and again a significant ramp-up around the time of the First Global HSR Symposium in 2010.

Figures 1, 2 and 3 present each category, separately, and show increase in the slope of each category over time. It may also be noted that in most graphs, 2015 typically experiences a publication lag. In Figure 3, 2015 showing an increase rather than a lag. This could be interpreted as a significant recent contribution by LMIC authors resulting in this category outpacing previous years. This would also corroborate analysis (figure not shown here) that publications by LMIC authors, and particularly authors from LIC, are increasing at a greater rate than any other category within the scope of this analysis.
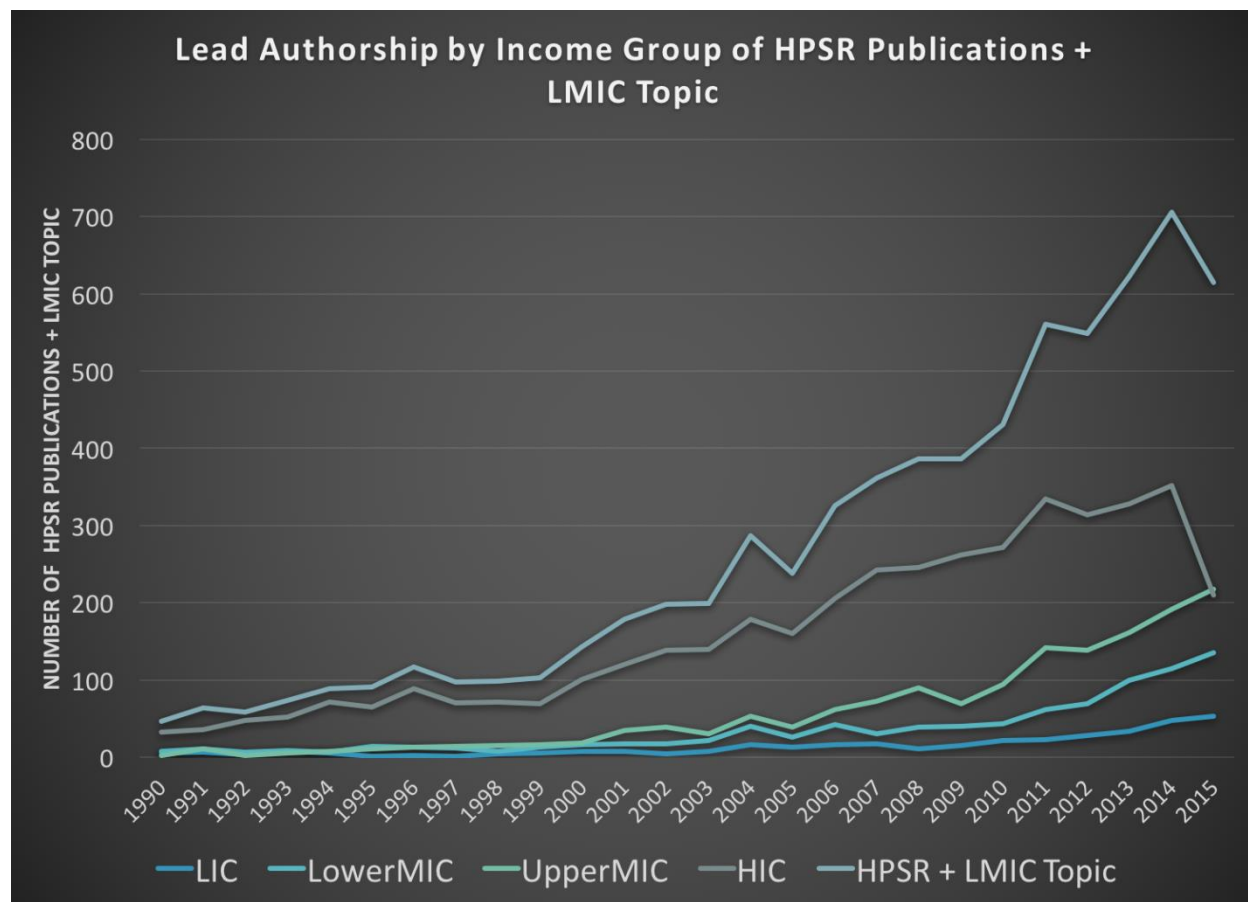
Figure 4: Lead authorship by income group of HPSR publications focused on LMIC relevant topics

Figure 4 demonstrates the relative contribution of each of the 4 income groups as they compare to all HPSR publications that focus of a topic relevant to LMIC. It shows the increase in all groups over time. What is not completely apparent from graphs depicting absolute numbers is that the contribution of LIC lead authors is actually increasing at a greater rate than all other income groups. This may be demonstrated when the graph is normalized.

In most figures, 2015 generally appears to have fewer publications but this is due to a lag between the publication date in some journals and their appearance (publication date) in PubMed. Given time, this year will continue the upward trend seen in all previous years.
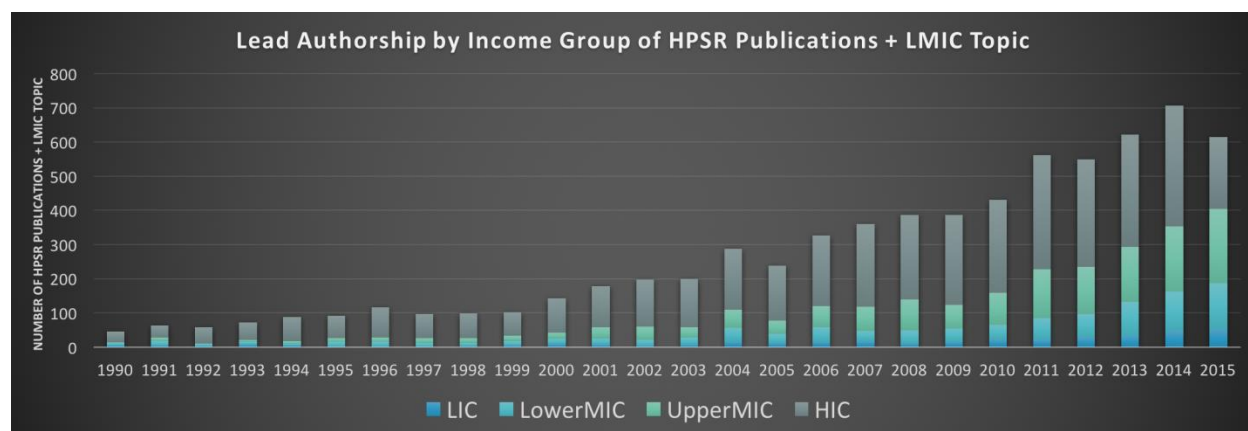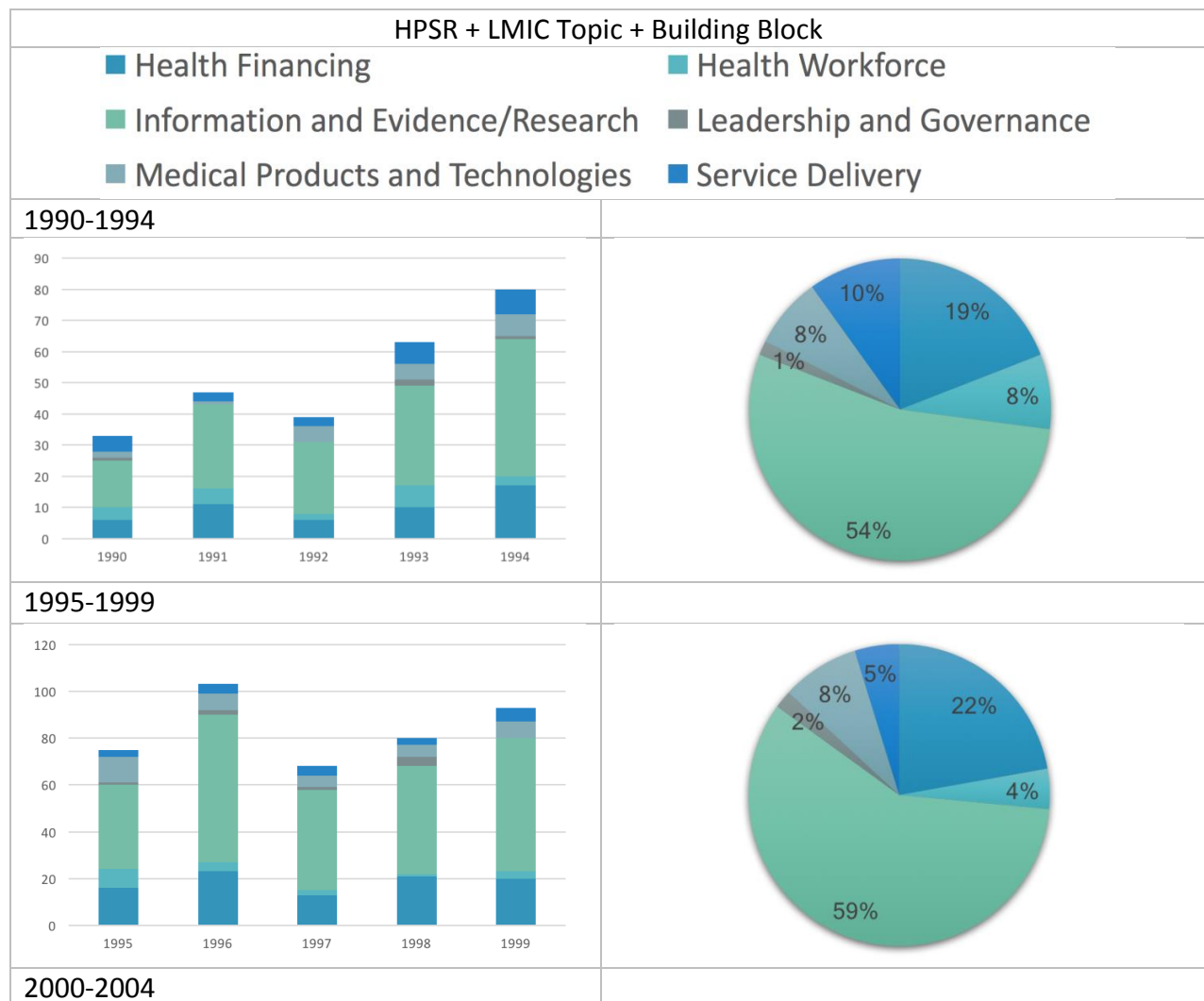
Figure 5: Lead Authorship by income group of HPSR publications focused on LMIC relevant topics

Using the same data as presented in figure 4, Figure 5 is depicted as cumulative bar graph, showing the proportion of each income group's contribution to all HPSR publications with a topic focused in LMIC. Unsurprisingly, in absolute numbers, LIC have the fewest, while HIC have the most. On the contrary, Lead authorship among LIC is increasing at a greater rate than all other country income groups.

Distribution and Influence of Building Blocks Over Time

Heath system has historically been viewed within a framework of 6 building blocks (BB). In the literature, disciplinary *inclusion* within a building block can be broad while exclusion is more well-defined, yet in practice the boundaries are often blurred. An approach to understanding the field of HPSR is to analyze each of these components. At any given time, each of the 6 building blocks is in different states of development and definition. Given this reality, defining some building blocks is more challenging than others. Additionally, attempting to compartmentalize the complexity of health systems into 6 discrete components may be an oversimplification.

HPSR + LMIC Topic + Building Block
■ Health Financing   ■ Health Workforce
■ Information and Evidence/Research   ■ Leadership and Governance
■ Medical Products and Technologies   ■ Service Delivery

1990-1994
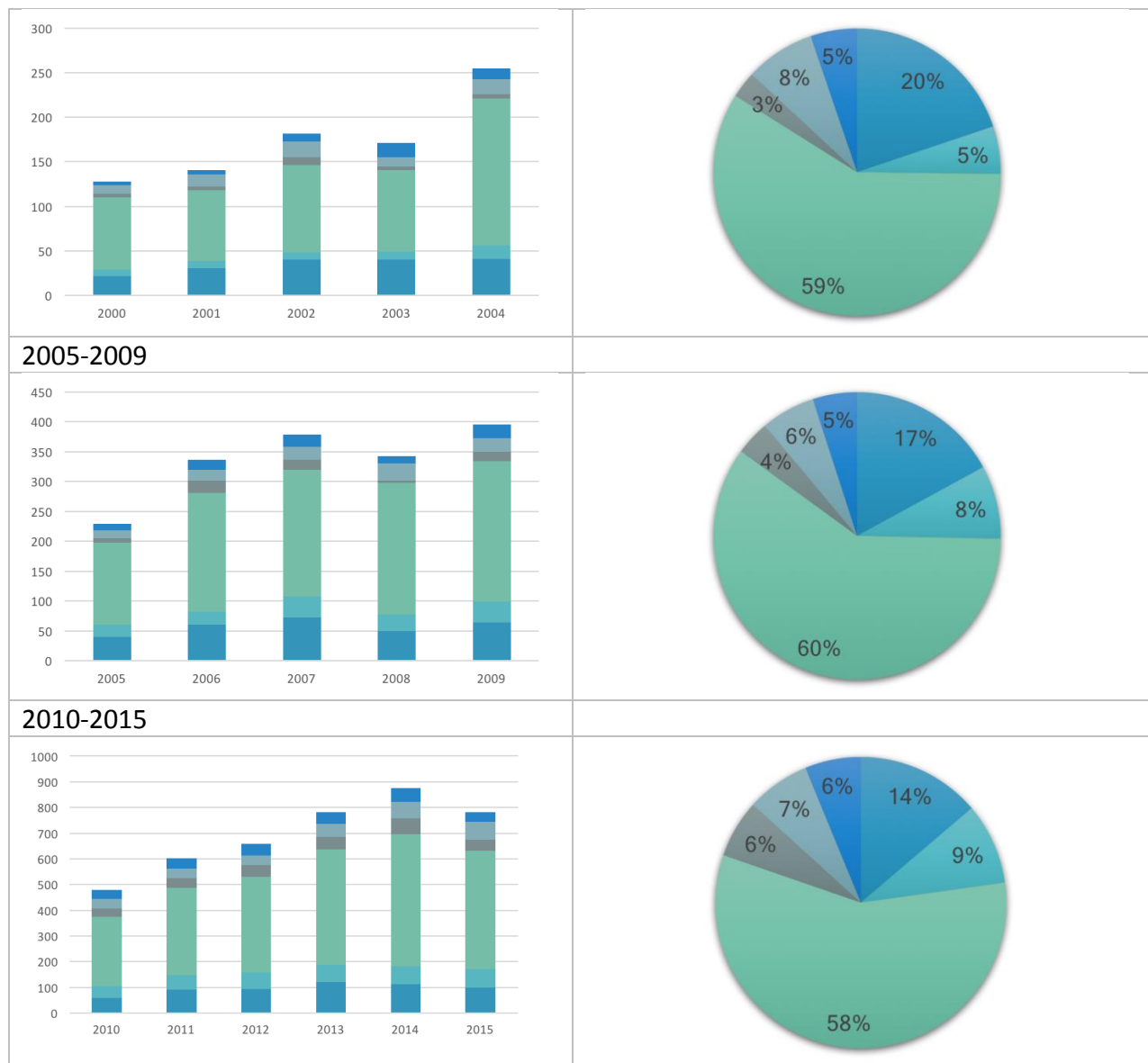

1995-1999

2000-2004

Figure 6: Distribution of HPSR +LMIC Topic publications among building blocks per year in 5 year increments.

The pie charts show the relative contribution of each of the 6 building blocks to HPSR literature that focuses on LMIC relevant topics grouped in 5 year intervals. It helps our understanding of the changes in focus with respect to building blocks over each interval. Generally, the distribution appears relatively consistent over the years.

As we have seen previously, in some areas the absolute number of publications that contribute may be low but their percentage of contribution increase significantly and/or vice versa. In the case of the building block "leadership and governance", from 1990-1994 this category had 1% of the pie, while in 2010-2015, it had 6%, seemingly a six-fold increase. In terms of absolute numbers, the same category increased from n=4 to n=268, in the respective time periods.

While the shifts in contribution over time are clear, more research is needed to determine *why* the changes take place.

Conclusions

As the Alliance celebrates its 20th anniversary, we look back with pride on the achievements and optimistically forward towards our contribution to achieving the Sustainable Development Goals.

A previous World Health Report outlined the four functions of an effective research system – setting priorities, building capacity, setting standards, and translating evidence into practice.[21] This bibliometric analysis attempts to demonstrate the effect of this leadership on the progressively-increasing participation, contribution and capacity within LMIC.

In looking back via bibliometric analysis, there may be a correlation between the timing of specific initiatives resulting from major meetings or reports and increases in the published literature on HPSR that ultimately follow. HPSR publications consistently comprise of about 10% of all publication in PubMed. This analysis demonstrates that the increase in publication frequency in HPSR literature is outpacing life and health sciences in general (PubMed), and the discipline is holding this momentum.

Until the inception of Alliance, participation in HPSR, in terms of lead authorship, by LMIC was low and level. The progressive advocacy for meaningful participation positively correlates to the significant increases in literature published on topics relevant to LMIC and the exponential increase in participation by lead authors from LMIC. As this evolution continues, synergies and collaboration lead to sustained, increased capacity for individuals, institutions and regions.

The increase in capacity within LMIC that facilitates lead authorship, combined with the global support to ensure HPSR meaningfully incudes those from LMIC is an effective combination. This momentum is driving the increase in the HPSR publications focused on an LMIC relevant topic with an LMIC a lead author to outpace PubMed as a whole.

The knowledge gained since the introduction of HPSR two decades ago solidified the necessity of using a complexity lens to study health systems as a complex problem. There are many interacting factors that affect and influence each other in different ways over time.

The outcome of this analysis may be indicative of the positive effect of the ongoing effort to ensure increased funding, institutional capacity building and knowledge production continues to support vulnerable populations and resource constrained settings. Providing the strong evidence to demonstrate that continued investment and evaluation will ensure success and meaningful inclusion of the regions that HPSR is meant to serve.

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