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Research article

Keywords: COVID-19, corona virus, Low- and Middle-Income Countries, socioeconomic impact

Posted Date: June 2nd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-32477/v1>

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Version of Record: A version of this preprint was published at Pathogens and Global Health on March 4th, 2021. See the published version at <https://doi.org/10.1080/20477724.2021.1878446>.

The covid-19 pandemic in Low- and Middle-Income Countries, who carries the burden? Review of mass media and publications from six countries

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Abstract

Rich countries used In the Covid-19 pandemic lockdown and physical distancing policies for transmission control. However, are these measures also suitable in countries with a fragile economy resting mainly on the informal sector? The impact of lockdown measures in disadvantaged population strata in six Low- and Middle-Income Countries (LMICs) was reviewed using i) systematic review of 17 published papers and ii) review of 90 media reports. Those who most suffered from the lockdown were migrants, workers in the informal sector (which is huge), small businesses, slum dwellers, women and elderly revealing the social, cultural and economic inequalities of societies.

Financial and food support for the poor was inadequate and sometimes mismanaged. In the better organized societies, the resilience was stronger (South Korea, Kerala/India) but also here the poor had to suffer most. It is strongly recommended that outbreak response strategies should particularly focus on the poor and vulnerable population.

Key words: COVID-19, corona virus, Low- and Middle-Income Countries, socioeconomic impact.

Introduction

After the start of the Covid-19 (SARS-CoV-2) outbreak in early December 2019, a visit by a WHO-expert team to China documented the lockdown strategy of the government.¹ At the same time a mathematical model suggested that the expected high epidemic wave in an uncontrolled situation should be converted into a long-lasting but low epidemic curve through strict transmission control.² These were major contributions to the decision of governments to drastically restrict peoples' movements by closing businesses, schools, universities, public events and others (lock down strategy) in order to enable the health services to cope with the large number of severe cases. This medical-epidemiological view did not envisage the societal aspects of the strategy in spite of the warning by economists.³ When the epidemic reached the High Income Countries (HICs) of Europe, the control strategies followed rather quickly the medical-epidemiological lockdown model neglecting initially the impact on the economy and societies. But what does lockdown mean for low- and middle-income countries (LMICs) where societies and health services are less well organized and the public sector is less able to economically support the extended informal sector and the mass of impoverished people? The concern of massive collateral damage has already been voiced by authors even in the richer countries criticizing that "this diffuse form of warfare, aimed at "flattening" the epidemic curve generally rather than protecting the especially vulnerable" cannot be the solution.⁴ What does the "flattening of the curve" through lockdown and "social distancing" mean for LMICs where the informal sector is predominant, and the poverty levels are high? To document the social and economic consequences of the lockdown strategy, the here presented study was undertaken in six countries with different socio-economic levels: South Korea, Mexico, Colombia, India, Nigeria and Nepal.

Methods and study sites

Study design

The study used mainly a systematic review approach analysing newspaper articles and Television messages collected by study participants in the target countries, complemented by a literature review.

Study sites and the “COVID-19 team” in target countries

Countries with different levels of poverty or economic strength in Asia, Africa and Latin America were selected. Economic indicators are presented in Table 1 showing, according to the GDP, three middle income countries (South Korea, Colombia and Mexico) and three lower middle to low income countries (India, Nigeria and Nepal). The informal economic sector was important in all study countries, but exceptionally high in the poorer countries. Also, the proportion of small businesses (self-employment) was around 80% in the poorer countries and less in the richer middle-income countries between 25.4% (South Korea) and 51% (Colombia). These figures indicate the proportion of the population expected to be particularly hit by the Covid-19 related lockdown policy.

For the collection of and analysis of local data, the “COVID-19 team” was organized. All team members, two per country, were academics working in local Universities or health services. They were continuously connected by internet allowing information exchange through a shared drive.

Search strategy and selection criteria

For the review of the literature, a systematic search of the literature was done to answer the question “What is known about the socioeconomic impact of the measures undertaken by the governments of the target countries?”

The search strategy included a combination of key words related to the categories “COVID-19”, “measures”, “interventions”, “impact” and “consequences” in the online databases PubMed, Cochrane library, WHO COVID-19 Global research database on COVID-19, Embase, and Google Scholar (searched on April 25, 2020). In order to generate a more comprehensive search, six individual searches combining the terms above and each target the country were conducted in Google Scholar (the first 100 hits per country were screened) until no new relevant information was

found (“saturation”). Inclusion criteria were: scientific articles with information on the socioeconomic impact of the public health measures related to COVID-19 adopted in our target countries.

Observational and intervention studies including qualitative, quantitative or mixed methodologies as well as literature reviews in English or Spanish available as full text were included.

COVID-19 is a newly discovered disease and it is recently declared as pandemic from The World Health Organization (11.03.2020), hence there are not enough scientific of information about it (especially in LMICs). However, considering the urgency of the matter, we included the second-line sources of the situation in the targeted countries in the literature review: This included preprint scientific studies in peer review journals, MedRxiv, and non-peer review journals. The excluded articles were letters to the editor, opinions, guidelines, commentaries and editorials as well as studies on other diseases.

Selection of the studies was done by one reviewer (TR). The pre-selected studies were screen by a second reviewer (AK) and occasionally, in case of uncertainty, by a third researcher (MAC). From an initial total of 3606 hits; the selection of relevant papers was carried out in three stages. First, the titles were evaluated according to the inclusion and exclusion criteria. Second, the same criteria were applied to the abstracts of the articles retained in the first stage. Third, the full text articles and articles without abstract availability in the previous stages were evaluated. Thus 17 publications were selected (see Prisma flow diagram by Moher et al., in Fig. 1).⁵

Mass media analysis

For more actual information, 90 newspaper reports (until 1st May 2020) from the six countries were collected by our local collaborators (“Covid-19 team”) using similar inclusion/exclusion criteria as the literature review except for “methodology”. Languages included were English, Spanish, Korean, Hindi.

To assess the intensity of lockdown measures in the target countries, the ‘Stringency Index’ of the strictness in governmental policies was calculated from the following indicators: Closure of schools, workplaces, public events, and public transportation; Restrictions on gatherings, internal

movements, and international travels; and the quarantine requirements. Computation of the index followed the methodology described by Hale et al.⁶ To estimate the stringency index, data of government responses in our target countries provided by the Oxford COVID-19 Government Response Tracker was used.⁷

Data management and analysis

Data extraction of the 17 studies selected in the literature review as well as of the 90 Newspaper articles/TV reports was performed using a separate spreadsheet for each review which included the following items: authors, year of publication, country, study design or type of document (Newspaper, TV report), status of the publication, methodology (scientific studies only) and results (Media reports, Supplementary Table 1; literature review, Supplementary Table 2). A narrative description is presented in the results section together with the information from Newspaper articles.

In the following text, the Newspaper articles are referenced with their ID numbers in the data summary sheet in square brackets (see references from the supplementary material). The papers from the literature review and other references are cited in upper-case letters and referenced at the end.

Results

Areas of concern in the fight against the Covid-19 pandemic

“The lockdown was sudden and not accompanied by effective social security measures” [31] was often mentioned in our study countries. Nepalese people felt that the information received was accurate but that there was no experience and hence no clear strategy in dealing with the crisis.^{8,9} In India there were contradictory perceptions; some were surprised about the sudden lockdown while others thought it came late particularly the travel restrictions from high risk areas.^{10,11}

Another common concern was related to the poor: “If the government does not ensure to feed the hungry, there will be more deaths due to starvation than due to Covid-19” (Nepal [61]). A study in

Colombia showed that sustainable solutions for all are needed, not just short term attempts to cope with the sick.^{12,13}

This leads to the question if the forced lockdown [7] is a feasible strategy in LMICs where the informal economic sector is predominant, and the poverty levels are high (Table 1)? Nevertheless, the lockdown in our study countries followed the European-Chinese model, being particularly intense in India and Colombia (Fig. 2) and less stringent in South Korea. What are the experiences and lessons learned? These will be presented under the following headings: Vulnerable groups, impact of the lockdown on people, their business and way of life and mitigation strategies by the government.

Fig. 2. The stringency index showing the level of containment measures by country

Vulnerable groups, an overview

Vulnerable population groups are those at a higher risk of suffering economic hardship or damage of their living conditions due to lockdown measures (societal view) or those who have a higher risk of dying due to the Covid-19 infection (medical view). To the most vulnerable groups belong:

- Migrant workers
- Refugees and asylum seekers
- Urban poor, homeless
- Workers in the informal economic sector
- Sex workers
- Women & children
- Religious groups and indigenous communities
- High risk groups for severe disease (elderly, chronic diseases, immunocompromised and others)

Impact of the confinement policy in LMICs

- i) Impact on people`s environment (crowding, high temperatures, limited mobility)

The difficulties or impossibility of physical distancing in hot climates under crowded living conditions were frequently reported. People's knowledge about physical distancing was satisfactory in Nigeria, but due to their jobs requiring physical contact it was impossible to implement.^{14,15} In Indian slums with 6 people living in one room and sharing with many other families a bathroom and toilet, or in Nigerian slums living 8 people in one room [46,44] physical distancing is not a viable option.^{16,17} "Social distancing is a privilege of the middle class" [58]. In Colombia, more than 5 146 197 houses have space deficiencies.¹⁸

Heat and water shortage are other concerns. Hot rooms without air-conditioning are unbearable particularly for children [40]. Water shortage in deprived areas does not allow for frequent hand washing or excessive water consumption in middle class families during home quarantine is threatening the water supply in dry areas [24].^{16,19}

A drastic increase of domestic violence was observed during the confinement-to-home period, mainly against women [4,25] and children [2,16]. In Mexico this type of violence increased by 27% within 3 months [25]. In Colombia the number of emergency calls by women increased by 76% [4] and the domestic violence and crimes against women even by 103% compared to the same month in the year before so that the government had to provide shelter for women and children subject to aggression [3].

Home office and home schooling were also an area of concern as they were reported to be only for the richer families who have a computer and internet connection and do not depend on school feeding programmes [8,71]. Also, the teachers had difficulties with the electronic equipment in Colombia [8].

ii) Impact on the informal economic sector

A large proportion of the economy in LMICs is based on the informal sector: Daily wage earners, street vendors, artisans, migrant workers, refugees, sex-workers and others. They were the first to suffer: "No work, no food" (Colombia [41]) or "I prefer to die from Corona virus and not from hunger" (Nigeria [50]). Containment means no customers or no transport to get to their work

(Colombia [9]). This situation was also described in the other countries (India^{10,20}, Colombia [9], Nigeria [47], and Mexico [28]). Also, the increased risk of child labour, sexual exploitation or forced child marriage in families who struggle to feed their members was mentioned [47,48].

Violent acts of vandalism have been reported, where food trucks were looted (Nigeria [81] and Colombia²¹) or food vendors were attacked by the hungry crowd. An aggravating fact is that in many countries people in the informal sector have no medical insurance (India [30] and Nepal [58]) and cannot receive medical treatment.

iii) Impact on migrant workers and refugees

Migrant workers or refugees are particularly vulnerable in the containment strategy. They are often not officially registered and not entitled to receive governmental benefits (Nepal [30] and Colombia [42]). With the lockdown, most of them lost their job, were fired by their landlords and had no more access to charity food provisions [65] and thus tried to get back home. The large number of Nepali migrant workers in India and Venezuelan migrants in Colombia -90% working in the informal sector [41]- were brought by buses [38] or forced to walk [41] to the border without any physical distancing. Sometimes Nepali migrant workers were sprayed with disinfectants or not allowed to cross the border because of the fear of infection and the same the other way round, Indians in Nepal, wanting to get back to their country were upheld and had to stay. At least both governments provided food and shelter [62]. In Colombia 14 000 Venezuelans arrived in the border cities; many more came from Ecuador, Peru or Brazil.²² Overcrowding was the rule as well as starving due to the closure of charity food provisions and of small food traders [65]. Those who crossed the border had still a long way to get home.

Another social risk group are internal migrant workers, those who came from rural areas to get a job in the cities. After the sudden lockdown large numbers of them tried to get home to their rural areas –reported in India, Nepal and Nigeria-, but they were stuck either because of the travel ban in India [32] or overcrowded public transport in Nepal [38]. Many of them tried to walk home, but after some casualties the government in Nepal was obliged to transport them [43].

iv) Impact on small businesses

Small businesses were among those who suffered most from the lockdown strategy.²³ In Mexico many were unable to pay taxes or had to close down [14,22,23] and/or had to reduce staff [14,6,27]. The same occurred in Colombia, India, and the other countries [6,53,59].¹⁹ Nepal suffered from the crash of the tourist industry and, just as the other countries, from the reduction of import, export, employment and increased inflation including increased in food prices.^{19,23,24}

v) Impact on social cohesion

A common observation in our study countries was, that the pandemic is unveiling social and economic inequalities. Examples are: Covid-19 “could set women back decades in gender equality” [107] or “exposed inadequacies in Nigeria’s social protection system” [48] or fuelled religious conflicts in India [66].

vi) Impact on peoples` anxieties

In Nepal and India, people were “upset, restless and sad with the unexpected lockdown”. The uncertainty of what will happen next made them feel nervous, stressed and worried and they asked for mental health care.^{10,26,27} Some reports showed the fear to get infected from health staff particularly in Mexico [26], Colombia [15] and India [36]. But fear worked also the other way round: Hospitals refused to accept fever patients [39].⁸ Fear can also lead to extreme actions such as attempted suicide [51] or resort to traditional healers [52].

vii) Impact on peoples` creativity (Survival strategies)

A number of reports describe peoples` adaptive capacity to the new situation. In Mexico small businesses avoided closing down by transporting medical equipment [22], others started to sell face masks or produce furniture [27]. More frequent was the switch to online businesses: to sell medical and funeral equipment [29] or other goods. In Colombia sex workers began selling fruits and

vegetables to compensate for the lack of income [1]. In India prisoners produced face masks [67] and in South Korea restaurants organized drive-thru services for customers to avoid human contact [77].

viii) Impact on peoples` instinct: Corruption and exploitation

Misuse of public resources when responding to the negative impact of containment were reported from several places. To these belonged overpricing of food packages, cleaning kits, or medical equipment and mismanagement of funds and excessive prices for medical care in private hospitals [17-21,57]. In Colombia contracts were wasted even in the Army.^{28,29}

Governmental (and private) mitigation strategies

i) Cash, food, shelter

Mitigation strategies include supportive packages to businesses, hospitals and the poor as well as early payments of pensions and delay of tax payments.^{8,9,17} However, in the poorer countries the government support has been described as being grossly insufficient. In Nigeria the social protection system is underfinanced excluding the poorest people [47,48]. Nigeria has provided cash relief to 3-6 million poor households, but 95.9 million people are living in extreme poverty [62]. Even those who benefitted received only a lump sum which guarantees the subsistence for less than a week. Often the promised help did not materialize leading to manifestations [64]. In Nepal the banks have extended repayment deadlines but no relief packages for the poor were envisaged [61]. In several countries landlords were obliged not to fire their tenants or to waive the rent for 3 months [54,55] but this was often not implemented [54].

However, there are also signs particularly from the private sector to contribute, for instance through online donor platforms in Nigeria [62].

ii) Health services interventions

Descriptions of weak health systems with a limited capacity to cope with large numbers of severely sick patients illustrated the difference with the better off countries. Complaints were particularly

mentioned in Nigeria –where the upper class usually goes for medical treatment to HICs [49], but also in Colombia [9], Nepal^{9,10}, and even Mexico.³⁰

The shortage of ICU-beds and of protective clothing was reported in all countries [82,46] but also the construction of provisional treatment units.^{8,31}

Alternative approaches in South Korea and Kerala/India

i) South Korea

Although South Korea had opted for another prevention strategy –namely to find through mass testing the infection chains for early isolation- a certain level of physical distancing and quarantine was introduced (see Fig. 2) which led to similar damage on vulnerable groups as in the other LMICs but to less extent. Vulnerable populations (e.g., elderly, low-income households, disabled, homeless, refugees) suffered from lack of food, shelter and workplaces [71] due to closing shelters and social welfare centres. Particularly the homeless, low-income children and disabled people did not get food supply [71] or cleaning support [75,76]; the elderly often suffered depression due to the shut-down of community welfare centres [70,75].

At a later stage, restaurants and hotels [77,79] and small-sized enterprises were hit by the lockdown measures and particularly the self-employed suffered from layoffs, unpaid leave of absence, and sales decline [69,73,77-79].

However, there were major endeavours by public and private institutions to limit as much as possible the impact of the lockdown measures (see the moderate stringency index for South Korea in Fig. 2).

In particular, private and public organizations started distributing facial masks and hand sanitizer as well as emergency food kits to vulnerable populations [75,78]. Free meals were replaced by lunch box deliveries [76]. There were support activities for workers in the informal sector [87,88] To ease the debt burden of vulnerable groups, repayments were postponed [88]. The general public collaborated by using face masks and keeping physical distance [72,77]. Social peace was maintained, and no major violent acts were reported.

ii) Kerala State in India

Kerala started mitigation activities very early which included preparing initial protocols, setting up technologies for contact tracing and quarantine [33]. Also, rapid testing was organized, following the example of South Korea. Kiosks were set up which collect samples within 2 minutes [34]. The state also introduced, apart from aggressive testing and contact tracing, an extended quarantine period from 14 to 28 days and established treatment centres [35]. The “Break the chain” campaign was declared urging people to follow physical distancing and personal hygiene [82]. Wash basins with liquid soap were installed at bus stops for handwashing [81]. Health workers are protected by masks, use sanitizers and follow other preventive measures [60].

The Kerala government announced an economic package of 2.6 billion USD and made a great effort to prevent starving: 1200 community kitchens were set up where meals are provided for free [60]. Kerala distributed 30 kg rice and 5 kg wheat to poor families along with providing free shelter [68]. For migrant workers thousands of homes were built. Inmates in jail stitched masks and prepared sanitizers [67]. To support home office, the state government cooperated with internet providers to increase network capacity and declared relaxations in loan repayments and rents. Also 2 months of advanced payment of pension was introduced [67].

The measures were so far successful as Kerala was the first state with a decline of new infections and a low case fatality rate [83]. Social peace was maintained.

Discussion

Containment strategies in LMICs and HICs: what makes the difference in the Covid-19 response?

Many hardships created by the containment strategy in LMICs are also occurring in the lower socio-economic classes of the rich countries. In the USA a disproportionately high percentage of poor Afro-Americans was infected or died of Covid-19 in several States.³² In New York “black and Latino people are dying at twice the rate of white non-Hispanics and low-income neighbourhoods have seen the largest case counts”.³³ Likewise the impact of the lockdown policies on small businesses is also described for the better-off countries such as the US where within 4 weeks, 22 Million people filed

jobless claims which –as in LMICs- is “exposing hidden weaknesses in the U.S. economy”.^{33,34} Also, the mass exodus from urban to rural areas has happened to a smaller extent in big cities of the UK, but not due to hunger but because people prefer the pleasant countryside.³⁵

Thus, examples for the described impact of the lockdown in LMICs (on living conditions, the informal economic sector, migrant workers/ refugees, small businesses, social cohesion, peoples` anxieties, but also on their creativity or bad instincts) can also be found in HICs, but the magnitude of the impact makes the difference. The USA has a GDP of 54 471 USD per capita versus 2,741 in Nepal, or 5,316 in Nigeria and has a self-employment rate of 6.3% versus around 80% in Nepal, Nigeria and India (Table 1). Countries with an important informal economic sector, high proportion of migrant workers and a weak social system are particularly vulnerable to social distancing measures. The desperate reactions by the poor in Nigeria and Colombia (looting, shop lifting) are an example [90].³⁶ The second difference between HICs and LMICs is given by the surge capacity or resilience to the pandemic threat which is related to the ability of governments to release a substantial amount of resources in support of the most affected ones. While in LMICs the corona virus relief packages are moderate to poor –as seen in our review-, the HICs can afford a much more generous alleviation policy such as the 2.2 trillion US Dollar worth CARES Act is promising in the US.³⁴

Differences in impact and resilience require different response policies: Excess covid-19 mortality or excess malnutrition and human suffering?

Is there for LMICs an escape from the dilemma to opt for one or the other extreme: strict virus transmission control through physical distancing and quarantine (“flatten the epidemic curve”), waiting for a vaccine or a drug versus relaxed transmission control with a focus on the vulnerable groups, investing in the improvement of the hospital infrastructure and waiting for the herd immunity to end the epidemic. The collateral damage of the first approach will likely be the long term increase of malnutrition and human tragedies but potentially benefit from a lower mortality (if the health services are of a reasonable quality); the collateral damage of the second approach will be

a higher short term mortality but will potentially benefit from a better health infrastructure (if the government invests in the health sector) and less societal and economic disruption.

The third option: Learning from alternative strategies

South Korea (following a similar route as Hong Kong, Singapore and Taiwan) and Kerala State in India (following the South Korean approach but with much stricter quarantine rules) may offer an alternative. They both are economically stable and have well established governance systems which allow quick and efficient responses to unusual events. In South Korea the massive testing policy with contact tracing and isolation of suspected individuals has shown its benefits avoiding a strict lockdown. Kerala opted for a combination of massive testing, quarantine and support of the poor with positive short-term effects; however the long term economic and social effects have yet to be determined.

Conclusion: Our study has shown that vulnerable population groups (workers in the informal sector, small businesses, migrant workers, refugees, homeless, and others) have to bear the highest burden of the pandemic and that better organized societies are better prepared for mitigating the social impact. It is therefore strongly recommended that when deciding on outbreak response strategies not only the impact on health but also on the society and its vulnerable population strata should be taken into account.

Declarations

Ethics approval and consent to participate

Only secondary data were analysed with the exception of personal observations by our “covid-19 Team”. The study was approved by the ethics committee of Freiburg University.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and/or analysed during the current study are available as supplementary material.

Competing interests

The authors declare that they have no competing interests

Funding

The article processing charge was financed by the German Research Foundation (DFG) and the University of Freiburg in the funding programme Open Access Publishing.

Authors' contributions

DJC, AAA, SYJ, JV, AJ, MRB, PA, RCS, MAC, JMV and SDM collected the of Newspaper articles. TRR, AK and MAC conducted the systematic literature review. DJC, AAA and SYJ prepared the spread sheets. DJC, AAA and AK wrote the text with contributions from all authors. All authors contributed to the interpretation of mass media reports, and reviewed and approved the final manuscript.

Acknowledgements

We would like to extend our sincere gratitude to Eduardo Alfonso Sierra (Colombia), Hyemin Park (South Korea), Martin Anto (India), Professor In-Hwan Oh (South Korea), Ronald Skewes Ramm (Dominican Republic), and Dr. Arun Padmanandan (India) for contributing information and supporting the study.

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Tab. 1 Selected economic indicators from WDI data, 2018

	Korea, Rep.	Mexico	Colombia	India	Nigeria	Nepal
GDP per capita, PPP (constant 2011 international \$)	36 777	18 134	13 321	6888	5316	2741
Informal employment (% of total non-agricultural employment)			57.2%	80.3%		
Self-employed, total (% of total employment) (modeled ILO estimate)	25.1%	31.6%	51.4%	76.5%	81.5%	79.8%
Vulnerable employment, total (% of total employment) (modeled ILO estimate)	19.2%	26.8%	47.2%	74.5%	77.7%	78.7%
Poverty headcount ratio at \$3.20 a day (2011 PPP) (% of population)	0.1%	8.8%	10.9%	46.7%	69.1%	35.4%

Source: World Development Indicators (WDI), compiled by the World Bank from officially recognized international sources. <https://data.worldbank.org/indicator?tab=all>

"Employment in the informal economy as a percentage of total non-agricultural employment. It basically includes all jobs in unregistered and/or small-scale private unincorporated enterprises that produce goods or services meant for sale or barter. Self-employed street vendors, taxi drivers and home-base workers, regardless of size, are all considered enterprises. However, agricultural and related activities, households producing goods exclusively for their own use (e.g. subsistence farming, domestic housework, care work, and employment of paid domestic workers), and volunteer services rendered to the community are excluded."

"Self-employed workers are those workers who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a self-employment job. i.e., jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. Self-employed workers include four sub-categories of employers, own-account workers, members of producers' cooperatives and contributing family workers."

"Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment"

"Poverty headcount ratio at \$3.20 a day is the percentage of the population living on less than \$3.20 a day at 2011 international prices."

Figures

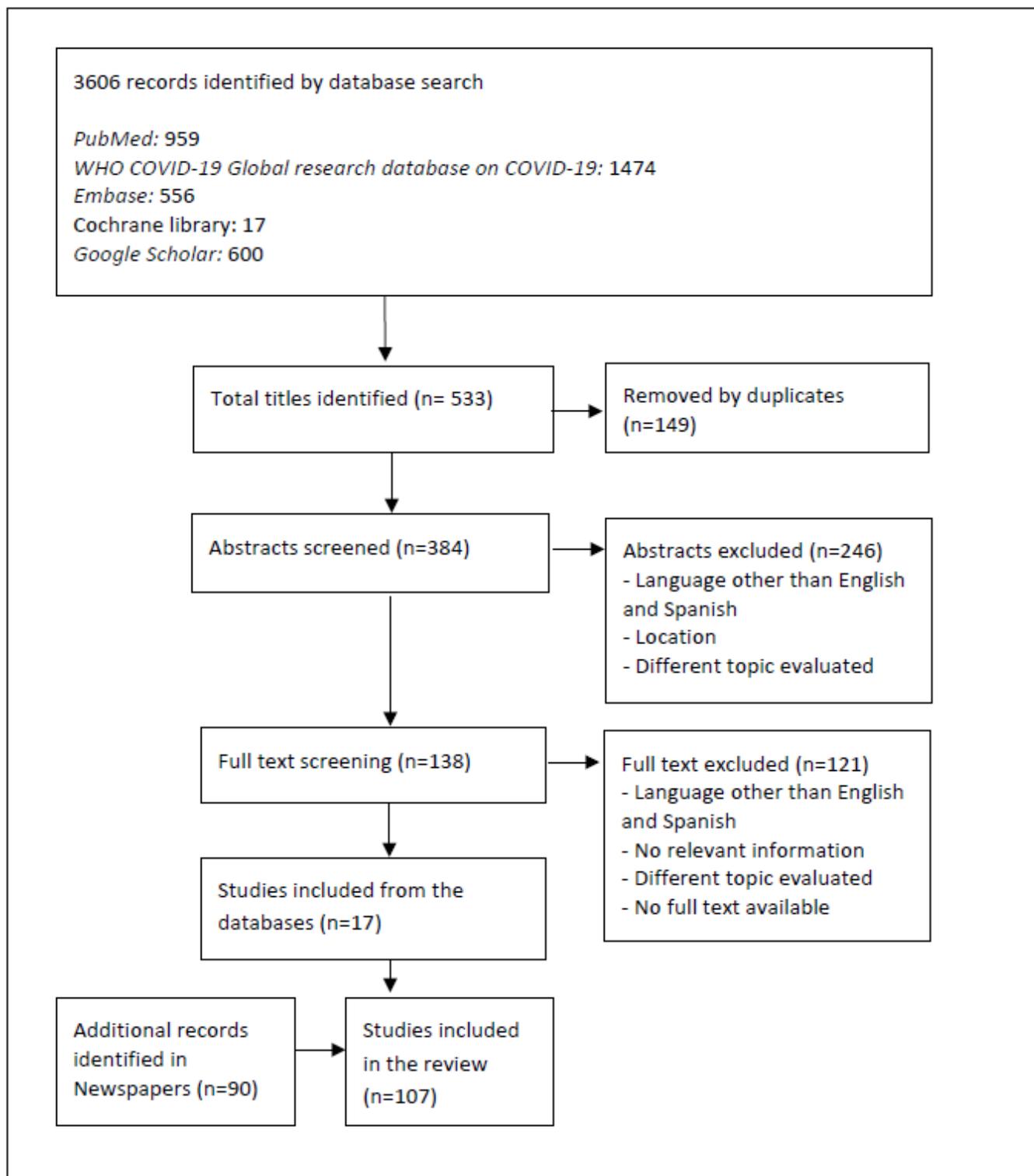
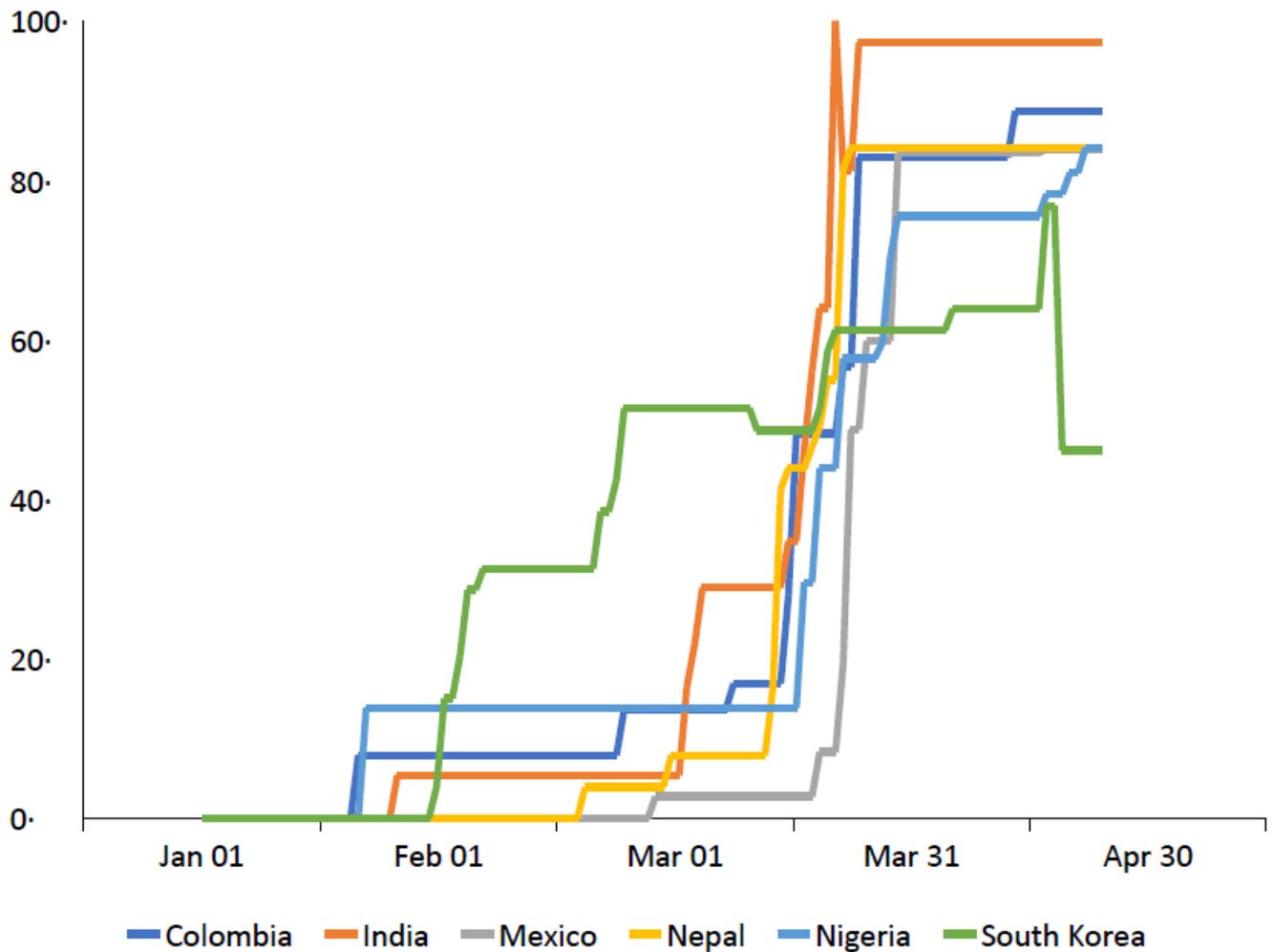


Figure 1

Selection of studies in the literature review



* Index of stringency of government responses to COVID-19; elements include: Closures in schools, workplaces, public events, and public transportation; Restrictions on gatherings, internal movements, and international travels; and the quarantine requirements.

Figure 2

The stringency index showing the level of containment measures by country

Supplementary Files

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