31% and 9% of households (1069 of 3479) and (5602 of 65 471) in LMICs were unable to afford two blood pressure-lowering medicines respectively [2017]. The results further interpret that a large proportion of communities in LMICs do not have access to more than one blood pressure-lowering medicine and, when available, they are often potentially unaffordable [Attaei and Khatib, 2017, Khatib et al., 2016]. Nevertheless, it should also be noted that only a small proportion of the population is employed in the government sector, and most of the population in LMICs earn much lesser than that of LPGW, therefore treatments which normally appear affordable, are too costly for poor and unemployed populations. Literature shows that treatment of HBP in Mexico is particularly troublesome, such as for every US$ 100 spent on HBP; approximately US$ 51 comes from household/family income. This shows a heavy social burden of the disease and indicates that HBP is an expensive disease and remains a high public health priority [Arredondo and Zuñiga, 2012].

Consequently, the unaffordable medicine prices result in non-compliance and dropout in antihypertensive treatment [Buabeng and Matowe, 2004, Caldwell et al., 1970]. Since adherence to medication and prescribing guidelines for hypertension consequently brings much savings in prescription costs, similarly, identification of the same solutions in which prescribing can be improved will be critical for the affordability of prescription of antihypertensive [Fischer and Avorn, 2004]. Therefore, a significant proportion of chronic disease morbidity and mortality can be prevented if medications are made accessible and affordable [Mendis and Fukino, 2007]. As for the poor population, the first treatment alternative is the public sector facilities, therefore the national health scheme should be introduced, to make the treatments affordable [Cameron, 2013].

These findings have important implications for public health and health policy makers and further, the results offer helpful insights about the affordability of selected surveyed antihypertensive drugs in LMICs. We found that LPGWs are pushed into poverty due to unaffordable cost of medicines. Our findings call for action, to addresses the issues around medicines affordability. Additional ways should be considered like, (i) availability of enough information about medicine prices to help physicians, pharmacists, and patients to decide in selecting cost-effective medication [Frazier et al., 1991, Hassali et al., 2010]. (ii) raising public awareness about medicines and its prices [Al-Gedadi et al., 2008, Roy et al., 2012]. (iii) developing and introducing generic substitution and minimum pricing policy (MPP) [Roy and Gupta, 2012, McManus et al., 2001, Hassali et al., 2012] and promotion of generics use [Babar and Ibrahim, 2007, Babar et al., 2011]. (iv) introducing cost containment policies such as reference pricing [Danzon, 2001], bulk public procurement [Tetteh, 2008], co-payments and health insurance [Harris et al., 1990], (v) close monitoring of national medicine policies' indicators [Jakobowicz et al., 1994], to identify areas where interventions are most pertinent to yield the main results in terms of controlling medicine prices [Kohler et al., 2012], and (vi) pharmaceutical industry regulators should not allow medicines on the market that no one can afford [Eichler et al., 2016]. If market forces continue to fail to bring down the medicine prices, medicine prices regulations should be considered to make sure that all have access to affordable medicines [Mendis and Fukino, 2007, Sakthivel, 2005, Nichols et al., 2004].

## Limitations

The findings of our study may be subject to several limitations. First, methodologically we included the affordability data of those countries where the data collection have been conducted from 2010 – 2015. However, this can provide a complete picture of antihypertensive drugs affordability. In addition, we limited to choose the medicines with the affordability of > 1.5 days wages, since as per Van Doorslaer et al.; we considered the population that would be pushed below an income level of US$1.25 or US$2 per day when having to purchase the medicine. Further for affordability measurement, we were bound to LPGW and impoverishment methods. However, the LPGW method is still used by WHO/HAI for affordability analysis. Further in the estimation of medicine prices as per WHO/HAI method we captured only the patient price/ full retail price; therefore, our findings do not take into account the discount, concession or any subsidies that the individuals might receive.

## Conclusion

Our findings suggest that low affordability of HBP treatment with large variability implies that no systematic medicine price regulation and control mechanism is in place in the surveyed countries. We hope that these insights will translate to new and better policy options for strengthening the existing pharmaceutical management system. In addition, these results will be useful to other potential researchers and will help to get closer to the issues around antihypertensive medication affordability.

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