PharmacoEconomics (2020) 38:125–134
https://doi.org/10.1007/s40273-019-00877-3

CURRENT OPINION

Talkin' About a Resolution: Issues in the Push for Greater Transparency of Medicine Prices

Brendan Shaw[1,2] · **Jorge Mestre-Ferrandiz**[3,4]

Published online: 20 January 2020

Abstract
At the 2019 World Health Assembly, a significant new resolution was agreed by most countries to start publicly sharing information on the real net prices they pay for medicines in their health systems. The resolution also includes provisions for countries to support other transparency activities. However, an additional proposal to require pharmaceutical companies to submit information on their internal sales figures, internal research and development costs, clinical trial costs and marketing costs for each individual medicine as a condition of registration, and for governments to publish this, was not agreed. Pressure for coordinated international action to increase the transparency of medicine prices and costs has been building for some time, as confidential discounts and rebates on prices of medicines are common. We argue that while it is possible that stakeholders may benefit to some extent from greater transparency on prices, several important policy and economic issues need to be carefully considered. Such transparency, combined with widespread use of international reference pricing, might undermine companies' differential pricing strategies, which are important in fostering wider access to medicines in low- and middle-income countries in particular, noting that access to medicines issues can occur in high-income countries as well. Moreover, there is a further risk that these types of proposals will lead to price fixing, less competition and higher prices than might otherwise be the case. The lack of any commitments in the resolution to greater transparency in payer decision-making processes also risks undermining the credibility of the resolution. The resolution and further transparency measures could have the potential to undermine patient access to medicines in the developing world, lead to higher prices in some markets and compromise long-term development of new medicines for future generations.

1 Introduction: The International Push for Transparency in Medicines Pricing

At the 2019 World Health Assembly (WHA) in Geneva, Switzerland a significant new resolution was agreed by most of the countries of the world where member states of the World Health Organization (WHO) agreed to start publicly sharing information on the real net prices they pay for medicines in their health systems. After much political negotiation [1–4], the final resolution contained a number of provisions, but the key provision agreed by the majority of countries was to "Take appropriate measures to publicly share information on the net prices of health products", where 'net prices' are "the amount received by manufacturers after subtraction of all rebates, discounts, and other incentives" [5]. Similar provisions on price transparency were included in a more recent resolution in September 2019 on universal health coverage endorsed by world leaders on the margins of the United Nations (UN) General Assembly in New York, NY, USA [6].

The WHA resolution also includes provisions for countries to support the dissemination of aggregated results and costs data from clinical trials if publicly available, work to improve information on company sales, revenues, subsidies and prices and the patent status of medicines, as well as support low- and middle-income countries (LMICs) to develop capacity in the development and procurement of medicines. Earlier initial versions of the WHA resolution [7] proposed by the Italian Government and supported by a range of other countries, but not ultimately agreed at the WHA, contained much more expansive transparency measures. These latter proposed measures would have requested

✉ Brendan Shaw
b.shaw@unsw.edu.au

1 School of Medical Sciences, University of New South Wales, Sydney 2052, NSW, Australia

2 Shawview Consulting, London, UK

3 Independent Economics Consultant, Madrid, Spain

4 Department of Economics, Universidad Carlos III, Madrid, Spain

Key Points for Decision Makers

While price transparency in markets might be seen by some as a panacea for what are perceived to be high prices, pursuing such initiatives should be done with extreme caution as experience in other industries and markets suggests such policy proposals could backfire.

There is a need to distinguish between the transparency of net prices, companies' internal costs, and public and private sector payers' decision-making processes. While stakeholders may benefit to some extent from greater transparency of medicines prices, several important policy and economic issues need to be carefully considered.

The proposals have the potential to undermine patient access to medicines in the developing world and compromise long-term development of new medicines for future generations. Further analyses are required to better understand the long-term implications of such policies should they be implemented.

national governments to require mandatory information be supplied from pharmaceutical companies on their internal sales figures, internal research and development (R&D), clinical trial and marketing costs for each of their individual medicines, vaccines and cell therapies as a condition of registration and then publish that information.

The resolution is already starting to have a knock-on effect on national legislation. For example, the French Parliament has already voted for a new provision to require disclosure of public funds used by pharmaceutical companies in R&D for new drugs entering market—albeit at the time of writing it is still to be approved as law [8].

1.1 Resolutions Have Been Coming for a While

Pressure for coordinated international action to increase the transparency of medicine prices had been building for some time. In many countries, discounts and rebates on medicine prices paid to public and private payers in health systems by pharmaceutical companies has been common [9] while the use of managed entry agreements and price differentials between list and net prices in markets such as the USA and Europe has been growing for some time [10, 11]. In the USA the differential between the official list price of medicines sold by pharmaceutical companies and the actual net price paid to companies once rebates and discounts are accounted for has been growing and is projected to grow further [12]. While the USA has quite a different system to that of many other high-income countries (HICs), the impact of the transparency resolution could have similar impacts in this market given the scale of the reported level of discounting. Such discounts have become a major political and policy issue, as demonstrated by the chief executives of seven major pharmaceutical companies being called before US Congressional Senators over the issue in 2019 [13]. The Trump Administration has also announced plans to introduce a number of policy initiatives to increase transparency of medicine pricing [14], whilst the pharmaceutical industry in that country has argued [15] that the real price of medicines had not increased by anything like the growth in list prices—a view that appears to be corroborated by industry data [12]. For the EU-5 countries (France, Germany, Italy, Spain and the UK), a difference of 1.4 percentage points has been estimated between the forecast growth rate for list and net pharmaceutical expenditure for 2017–2021 (2.9% and 1.4%, respectively) [16]. In Australia, there is a significant difference between net and actual medicine prices and medicine expenditure by the government [17, 18]. There is more evidence indicating an increase in the use of confidential discounts, although there is no one-size-fits-all approach to discounting. Not all products will have discounts, and the extent to which they do varies between products and diseases. Factors increasing the level of discounts include the number of competitors, while in the case of monopoly products there may be no discounts, particularly for lower-income countries [9, 19, 20]. The growing divergence between list and net prices of medicines, and the lack of transparency in these, had started to become a policy issue for government payers [11, 21].

There has been growing frustration and increasing scepticism among governments, some health policy experts and some non-government organisations (NGOs) over the rising price of medicines. As identified by the WHO in a report on cancer medicine pricing [22], governments' concerns about the increasing price of medicines have grown to include HICs as well as low-income countries. Some government payers have complained they cannot effectively determine the correct or appropriate price for medicines because the real effective prices elsewhere are unknown. Groups such as Medicines Sans Frontiers and Knowledge Ecology International have been campaigning for years for greater transparency of how pharmaceutical companies set their prices, in part because they and other stakeholders have not accepted arguments put forward by the industry to explain medicine prices.[1]

The push for mandatory company disclosure has been building in the global health community in recent years.

[1] The interested reader can find more information on such campaigns in their respective websites, https://msfaccess.org/ and https://www.keionline.org/.

Such proposals were contained, for example, in the 2016 "Report of the United Nations Secretary-General's High-Level Panel on Access to Medicines" which called for such provisions [23]. It argued that companies should be required to report to governments their costs of R&D, production, marketing and distribution of health technologies, together with public funding received in developing these technologies. Similarly, the WHO has hosted two stakeholder forums to examine the issues surrounding medicine pricing. These WHO Fair Pricing Forums in 2017 [24] and 2019 [25] similarly canvassed issues and concerns around the transparency of pricing strategies used by the pharmaceutical industry and payers.

Several arguments have been put forward by proponents in support of such measures. The concern is that pharmaceutical companies have too much market power in the pricing of medicines due to confidentiality and that there is insufficient availability of public information on pricing. For example, in proposing the resolution at the 2019 WHA, the Italian Government argued that "policies that influence the pricing of health technologies or the appropriate rewards for successful research outcomes can be better evaluated when there is a reliable, transparent and sufficiently detailed data on the costs of R&D inputs" [26]. Proponents of such measures argue that greater transparency of actual prices of medicines, through publication and sharing of price net of confidential discounts, will assist public and private sector payers to ensure they are paying efficient and competitive prices. A related concern is that the rise in the use of confidential discounting has led to a situation where payers cannot accurately judge whether they are agreeing to a competitive price when negotiating pricing deals with companies. For instance, payers see key drawbacks with negotiating confidential discounts such as the "Lack of transparency of final prices in other health systems" and "Uncertainty about whether best possible price is achieved" [9].

Essentially, the argument is that companies have been setting higher and higher prices for medicines without justification and have been able to do this due to the lack of information and transparency in the medicines pricing market. The intention of these proposals is to overcome asymmetric information in the market by requiring the collection and publication of actual market prices as well as internal company commercial information.

2 Possible Impact of a Resolution

It is possible that all stakeholders may benefit to at least some extent from greater transparency of the actual price of medicines compared to the official list price. The pharmaceutical industry itself has started publishing at least aggregate reports on levels of discounting in the USA [27]. Companies such as Eli Lilly [28], Janssen [29] and Merck & Co. [30] have published pricing transparency reports highlighting the level of discounting between their list and net prices. As noted in Sect.1.1, research shows and partly quantifies, as far as data permits, such discounting. Perhaps more importantly, the fact pharmaceutical companies themselves are starting to publish at least aggregated reports on discounting shows that the industry itself is starting to come to terms with greater transparency of the market price of medicines. The data that are available tend to show that actual net prices for medicines in places such as Australia, Europe and the USA are substantially below list prices. While change may present some challenges and create new competitive dynamics in the industry, it is possible that greater transparency of actual market prices may lead to greater efficiencies in the market. Patients, payers and pharmaceutical companies may benefit from more open, transparent reporting of what prices pharmaceutical companies are actually selling medicines for, what additional costs are being added in the distribution and supply chain, and the ultimate or final actual market price for medicines paid by patients and payers.

There are, however, several policy and economic implications that should be carefully considered, ideally before any new measures to increase transparency of the market price of medicines are introduced. Our concern is that these resolutions on transparency were agreed without consideration of their long-term dynamic market effects, including the impact they might have on current pricing agreements globally and, ultimately, the prices paid by patients and payer in various markets.

2.1 Risk of Undermining Companies' Differential Pricing Strategies

A concern coming out of the resolution is that if countries do start publishing the actual prices they pay for medicines in different countries, it could lead to higher prices for medicines in both LMICs and in HICs. It is not inconceivable that payers in some HICs have negotiated quite substantive discounts on the prices they pay companies for medicines. There is evidence to suggest that some HICs have secured confidential pricing deals with manufacturers with prices at significantly lower levels than the notional official price—the evidence to support this increasing trend was mentioned in Sect. 1 [9–11, 20]. The sudden publication of net prices triggered by resolutions on price transparency could lead to a situation where pharmaceutical companies may be forced to recalibrate their pricing levels globally, especially if there is a tendency towards the lowest net price—say via international reference pricing, as discussed in this section. Such discounts have typically been confidential in the past, but it is possible there may be some difficult pricing discussions between payers and companies to come in some of these markets.

One example is the pricing dynamics in the US market, which tends to have higher prices for medicines than other HICs [23, 31], a point demonstrated by the Trump Administration's push to introduce measures to reduce medicine prices, including transparency initiatives. Growing political pressure in the USA in response to price increases and debates about the affordability of medicines for low- and middle-income patients have fuelled the push for greater price transparency in that country.

More generally, the interaction of international reference pricing policies used by many countries together with the new transparency provisions needs to be considered, particularly the potential impact of rising medicine prices in low-income countries. Pharmaceutical companies have been introducing more differential pricing strategies in partnership with various payers and international organisations to provide medicines at lower prices to lower-income populations in LMICs [32–34]. The pharmaceutical industry [35], some health policy experts [36, 37] and the WHO [23] have all flagged that differential pricing strategies can be an important way to improve the affordability of medicines in LMICs. For discussion on the definition and measurement of affordability see, for instance, the "Report of the United Nations Secretary-General's High-Level Panel on Access to Medicines" [23] and Ewen et al. [38].

However, the use of international reference pricing policies, whereby governments and other payers reference their approved price for a medicine against a basket of other countries' prices for that medicine, risks undermining this differential pricing strategy in the context of transparency of net prices [39]. Others have argued that international reference pricing should cease to exist and be replaced by a new system for price discrimination, together with an increasing demand for value-based pricing [40]. If other countries implementing international reference pricing policies seek to reference their price for a medicine against the lowest published net price for a medicine in an LMIC, it risks undermining the whole practice of differential pricing. Examples such as the Pan-American Health Organization (PAHO) insisting on price reductions and deep discounts on vaccines to match lower prices in other countries [41] and recent initiatives by the US Government to insist on price equivalence with other countries [42] illustrate the temptation for governments to demand price reductions when they learn that other countries may have secured a better pricing deal.

This could have adverse impacts on patient access to medicines in LMICs. Organisations such as the Access to Medicine Foundation [32] have identified that differential or equitable pricing approaches are important parts of company strategies to improve access to medicines in low-income settings.

However, the (limited) evidence available illustrates the impact of this pricing policy on several dimensions, including cost containment, access to medicines and delays in access and efficiency [43–47]. It is worth noting here that one of the problems for both those who support and those who oppose differential or equitable pricing is the relative lack of data to evaluate such strategies. More work could be done to improve the evidence here and to evaluate the impact of such pricing strategies on patient access. The same could be said for international reference pricing policies. It is our understanding that there is neither strong evidence supporting nor contradicting whether there has been convergence in the price of medicines over the last couple of decades, as different studies show conflicting views [43, 45, 47–50].

If actual net prices of medicines in different countries are going to be published and shared across countries, there may well be a need for the development of a new policy framework, resolution or protocol where governments accept and agree that countries at a lower income level should pay less for medicines than other countries on higher income levels, assuming price differentiation is the objective. This agreement could be based on the principles that payers could price medicines based on the value of that medicine to society, subject to that society's ability to pay, which in turn is influenced by income levels. Thus, wealthier countries may have to accept that they pay more for medicines than poorer countries. This situation has been described as value-based differential pricing [37].

In the absence of such a policy agreement there is the real risk that countries of all income levels will trigger a race to the bottom in medicine prices. Whilst this might appear an attractive goal to reduce costs in the short-term, it could encourage pharmaceutical companies to establish one standard price for a medicine across all countries, poor and rich alike, rather than try to finesse the price to fit with a country's ability to pay. This could well undermine companies' current pricing strategies to improve access to medicines for patients in poorer countries—noting that pricing is one of the many issues affecting access to medicines in LMICs [32].

There is a widespread view that the current situation of limited access to medicines in many locations around the world needs to change and the resolutions about price transparency are seen by some as one way to try to solve some of these challenges. However, our concern is that such resolutions might actually also work in the other direction and worsen the situation.

2.2 Risk of Further Transparency Leading to Price Fixing and Higher Prices

We also have further concerns about an initial proposal that was not included in the final WHA resolution, namely the proposal that governments require companies to declare and publish internal commercial information about their costs

of development, manufacturing and marketing of individual medicines, vaccines and cell therapies. The recent French initiative mentioned in Sect. 1 illustrates the desire to take this further step, as companies will need to report the level of public funding used in their R&D spend for each new medicine entering the market. From our understanding, it is still unclear how exactly this initiative will be implemented; at the time of writing, it had been voted on by the French National Assembly, but still had to pass the French Senate.

It is somewhat reassuring, in our view, that at least for now, such proposals were not agreed at the WHA. Proposals such as these, if they were to go ahead, could have serious implications for the efficient and effective operation of the pharmaceutical market. If companies are forced to publicly reveal information on variables such as their internal pricing strategies, cost of goods, cost of research and marketing, and profit margins to governments, and if this information is then published and shared among governments and the broader community, the obvious implication is that the companies themselves will see each other's internal commercial strategies.

In our view, this should ring alarm bells for any competition authority, anti-trust regulator or economist concerned about protecting consumers' interests. Competition law and economic policy have evolved to ensure that companies do not share such information. This is done precisely to protect the public interest by ensuring that competitive markets deliver competitive prices and do not gravitate to agreed higher prices or to collusive arrangements. For example, the Organisation for Economic Co-operation and Development (OECD) has warned of the potential anti-competitive risks from bid-rigging where governments publish too much pricing information in procurement tenders. It warns "When publishing the results of a tender, carefully consider which information is published and avoid disclosing competitively sensitive information as this can facilitate the formation of bid-rigging schemes, going forward" [51]. Similarly, as recently as 2018 it highlighted significant potential policy risks of distorting the market by using policy to react to what are perceived to be excessive prices, particularly in the case of innovative patented medicines: "Special caution is warranted in sanctioning excessive pricing with respect to products covered by IP [intellectual property] rights because the misapplication of competition law might undercut incentives to innovation. As such, there is broad agreement that there should be no intervention against excessive prices for innovative products within a pharmaceutical product's patent life and, in effect, no such case has ever been brought within the OECD to this moment" [52].

Publication of such data can lead to collusion by companies and/or the establishment of accepted pricing norms that can impede competition, leading to higher prices and ultimately penalising consumers. For example, the European Commission has warned in its guidelines on horizontal agreements between companies that "Collusive outcomes are more likely in transparent markets. Transparency can facilitate collusion by enabling companies to reach a common understanding on the terms of coordination, or/and by increasing internal and external stability of collusion. Information exchange can increase transparency and hence limit uncertainties about the strategic variables of competition (for example, prices, output, demand, costs, etc.). The lower the pre-existing level of transparency in the market, the more value an information exchange may have in achieving a collusive outcome" [53]. The EC then goes on to document the variety of ways that this type of transparency can lead to common understandings between companies and a lack of competition, leading to poorer outcomes for the community, citing past cases in the finance and travel industries. The US Federal Trade Commission has also advised caution when considering such price transparency initiatives over concerns that publication of previously confidential company data could lead to collusive behaviour and higher prices [54].

Real-world examples in other industries where similar types of transparency initiatives led to collusive behaviour by firms include the Danish cement market where average prices increased by between 15% and 20% within a year of the introduction of similar price transparency measures [55, 56], the Chilean petrol market where average profit margins increased by 9% after similar measures were introduced [57] and the British tractor market where firms colluded to allocate market share [58]. These all occurred largely as a result of measures similar to those being proposed in the WHA medicine price transparency resolution.

More generally, the discipline of industrial organisation and competition economics has looked for many years at the potential risks of collusive behaviour and higher prices being triggered by firms awareness of each other's prices or by reaching a common understanding on pricing [59, 60]. The pro- or anti-competitive effect of greater price transparency on a market is not straightforward and depends on the balance of a range of factors examined at length in these disciplines [61].

Our concerns here are twofold: (1) that economic and industrial organisation theory and practice suggests that policy measures to implement the types of measures envisaged in the WHA transparency resolution could potentially lead to medicine prices being higher than they might otherwise be; and (2) it is not at all clear that much of the extensive literature and policy experience related to these issues were considered when the WHA transparency resolution was being developed. While the literature tells us that collusive behaviour leading to price increases is not a given and could possibly benefit consumers [62], whether this occurs or not depends on many market- and industry-specific factors that we suspect have not been fully addressed.

Our fear is that in the market for pricing medicines there is a risk that such measures, while perhaps well-intentioned, may backfire. It is possible that publication of sensitive company commercial information could lead to a reduction in competition and higher prices for medicines. This could occur as companies, either deliberately working together or individually doing their own assessments against the published data, gravitate towards a standard cost of goods, profit margin and price. The reality is that often competition in pharmaceutical markets occurs at the therapeutic level [63]. In some therapeutic areas, such as insulins for diabetes mellitus or new antibiotics, there might only be a handful of companies competing against each other, giving rise to limited competition. Ultimately, this sort of proposal could severely reduce the efficiency of the international pharmaceutical market and lead to higher prices for payers and patients. However, we feel there is little evidence that there was an assessment of this risk by those advocating for this change.

While the proposal to publish internal company costs and margins was not agreed by countries at the WHA, there are those who are continuing to push for its introduction and see it as unfinished business as part of their campaign to increase transparency [64, 65]. We believe publishing this commercially sensitive information could lead to even greater risks of anti-competitive behaviour, price signalling and higher prices in the medicines market.

3 Transparency of the Process of Payer Decision-Making: A Missing Element?

Another important area of transparency in medicine pricing that was not mentioned as part of the WHA resolution is the transparency in the decision-making processes and decisions of purchasers and funders of medicines. We think this is an important omission that deserves further attention.

There have been moves to increase the transparency in the process of payer decision-making over the years. These include the European Commission's Transparency Directive [66], which applies to European Union (EU) countries, provisions contained in free trade agreements such as the Australia–United States Free Trade Agreement [67] and the Korea–United States Free Trade Agreement [68], and the EU Health Technology Assessment (HTA) Proposal [69]. It is important that the processes that public and private sectors payers use to evaluate the listing of new medicines in a national formulary or international medicine lists are predictable, fair, transparent and efficient. Work by health economists over the years [70–74] has shown the importance of this for good decision-making in health policy that is consistent with the principles of best practice administration.

Stakeholders, be they companies, patients or healthcare practitioners, should be engaged in the process and informed about the reasons why a medicine has, or has not, been included on a formulary or healthcare plan. There are examples where both high-income [75, 76] and low-income countries' decision-making processes have not been transparent, predictable, objective or even ethical. Transparency of government reimbursement and purchasing decisions can help reduce corruption in such processes [51].

There are those who have suggested that government pricing and procurement decisions should not be transparent [77] as it risks undermining government agencies' ability to control costs. However, the balance of opinion on best practice HTA administration recommends that transparency in government and other payer decision-making processes concerning medicine pricing, purchasing and reimbursement should be transparent.

Whilst commercially sensitive material should not be released for fear of leading to anti-competitive behaviour and price fixing, noting that countries often already delete certain sensitive information from publicly available HTA reports, the processes and reasons for payer decisions on pricing and reimbursement should be as transparent and accessible as possible to companies, patient groups and the broader community. Even where the degree of transparency in a country's decision-making could be deemed high, e.g. that of England's National Institute for Health and Care Excellence (NICE), it has been argued that based on submissions to NICE, there are still some complex issues to address in finding the appropriate balance: "Appropriate redaction ensures discounts remain confidential, yet maintains the transparency of the HTA decisions made. Complete redaction does not allow for transparent, justifiable decision making" [78]. Participants and beneficiaries of the medicines pricing system do have a right to know why a medicine was or was not reimbursed and what factors came into the final decision.

4 Conclusions: Where to From Here?

While not having the legal standing of an international treaty, resolutions by member states at UN forums such as UN High-Level Meetings and WHAs imply that those member states will now at least try to implement the provisions therein. One can therefore expect that countries may soon start collecting and possibly publishing the real, net price of medicines being sold in their countries—assuming they themselves know the real prices of medicines being sold.

Some NGOs have indicated [79–82] that they are not satisfied with what they see as the compromised final resolution and have suggested they will campaign further for additional resolutions on publishing companies' internal commercial

pricing and cost information. France may soon request information on the amount of public funding received by private pharmaceutical companies as a pre-condition to enter that market. As suggested earlier, this could have substantial unintended adverse consequences for the operation of pharmaceutical markets for governments, payers—both public and private—, patients and the community. While the ultimate impact of publishing net prices of medicines from countries around the world is unclear, there is a risk that, as has occurred in other markets, greater transparency of company prices, costs and profit margins could lead to active or passive collusion and contribute to higher prices for medicines for patients. We have argued before that there are still currently important limitations in the access to medicines globally, and even more in LMICs. However, we believe that further analysis is required before implementing policies driving greater price transparency. Other policy tools might achieve a better outcome and avoid the potential risk of promoting collusive behaviour and higher prices in the market.

National governments should consider whether it is ultimately in society's long-term social and economic interests for such provisions to be implemented to the extremes being proposed. While there is scope for dialogue among stakeholders on this topic, in many cases we believe it is not always in society's long-term interest for some of these transparency proposals to become reality.

Should such proposals go ahead, and we have raised several concerns about whether they should, indicators should be developed to measure their effect on medicine prices, affordability and availability. Collection of indicators such as net price levels in particular markets, the number of suppliers in the market and the availability of medicines to patients in high-, middle- and low-income countries could be important. Ideally, data should also be collected on the extent to which companies gravitate towards a common standard on things such as profit margin and cost of goods if these are collected and published by payers. Data should be collected and market analysis undertaken to understand whether greater transparency has led to higher prices, less competition, less investment in innovation and poorer access to medicines for patients.

Payers funding health insurance systems should consider the potential impact of such proposed price transparency measures on their ability to secure competitive pricing deals. The upshot may be that their customers and citizens pay higher prices for medicines in the future. Payers should look at their own decision-making processes to assess whether they are consistent with the transparency principles being proposed for companies and markets.

The long-term impact of these types of transparency proposals should be carefully considered. Without some sort of international acceptance of the benefits of differential pricing of medicines and that higher-income countries may have to pay more for medicines than lower-income countries, there is a risk that poor people in LMICs will not be able to afford the higher medicine prices that may be triggered by the interaction of price transparency and international reference pricing. Our suggestion is that should transparency measures go ahead, some sort of international-level agreement should be reached where governments and payers accept that pharmaceutical companies can and should charge some countries more than others for the same medicine.

Pharmaceutical companies and the industry more broadly should develop positions on the various provisions and implications of these important developments in global health policy. Our sense is that currently companies and the pharmaceutical industry do not have a position on these provisions, which is a problem.

Finally, patient groups and the community more generally should consider whether such immediate transparency in the short-term will provide long-term benefits for society. Our view is that the search for a short-term 'quick fix' to perceived problems in medicine pricing could lead to significant long-term legal, social and economic problems relating to the development of new medical technologies in the future.

It behoves the broader policy community to ensure that declarations on the transparency of medicine prices and costs ultimately benefit patients and the community, both now and in the future.

Author Contributions Brendan Shaw conceived the idea of the paper, and both authors discussed the results and contributed to the final manuscript.

Compliance with Ethical Standards

Funding No funding or support was received for the preparation and writing of this article.

Conflict of interest Brendan Shaw and Jorge Mestre-Ferrandiz have no conflicts of interest to declare. Brendan Shaw and Jorge Mestre-Ferrandiz carry out research and consulting projects for pharmaceutical firms as well as other public, private, charitable and community organisations.

References

1. Fletcher ER. Italy floats proposal for new deal on drug pricing at World Health Assembly. Health Policy Watch. 2019. https://www.healthpolicy-watch.org/italy-floats-proposal-for-new-deal-on-drug-pricing-at-world-health-assembly/. Accessed 2 Jun 2019.
2. Fletcher ER. World Health Assembly approves milestone resolution on price transparency. Health Policy Watch. 2019. https://www.healthpolicy-watch.org/world-health-assembly-approves-milestone-resolution-on-price-transparency/. Accessed 31 May 2019.
3. Knowledge Ecology International. Improving the transparency of markets for medicines, vaccines, and other health-related products

and other technologies to be discussed at the 72nd session of the WHA to be held on 20-28 May 2019. 2019. Provisional agenda item 11.7, Version 20/5/2019. https://www.keionline.org/wp-content/uploads/WHA-Resolution_DRAFT_20-05-2019.pdf. Accessed 31 May 2019.
4. Cullinan K. Medicine price transparency is a sticky issue at WHA. Health-E News. 2019. https://www.health-e.org.za/2019/05/27/medicine-price-transparency-is-a-sticky-issue-at-wha/. Accessed 31 May 2019.
5. World Health Organization. Improving the transparency of markets for medicines, vaccines, and other health products (FOOTNOTE). Draft resolution proposed by Andorra, Brazil, Egypt, Eswatini, Greece, India, Italy, Kenya, Luxembourg, Malaysia, Malta, Portugal, Russian Federation, Serbia, Slovenia, South Africa, Spain, Sri Lanka, Uganda, Seventy-second World Health Assembly, Agenda item 11.7, A72/A/CONF./2 Rev.1. 2019. p. 2. http://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_ACONF2Rev1-en.pdf. Accessed 31 May 2019.
6. United Nations. Political declaration of the high-level meeting on universal health coverage, Resolution adopted by the 74th General Assembly. https://undocs.org/en/A/RES/74/2. Accessed 6 Dec 2019.
7. Grillo G. Letter to World Health Organization, Ministero della Salute, Italy. 2019, http://www.salute.gov.it/imgs/C_17_notizie_3670_listaFile_itemName_1_file.pdf. Accessed 11 Aug 2019.
8. Ren G. French Parliament to require disclosure of public funds used in R&D for new drugs entering market. 2019. https://www.healthpolicy-watch.org/french-parliament-to-require-disclosure-of-public-funds-used-in-rd-for-new-drugs-entering-market/. Accessed 2 Dec 2019.
9. Morgan S, Vogler S, Wagner A. Payers' experiences with confidential pharmaceutical price discounts: a survey of public and statutory health systems in North America, Europe and Australasia. Health Policy. 2019;121:354–62.
10. Pauwels K, Huys I, Vogler S, Casteels M, Simoens S. Managed entry for oncology drugs: lessons from the European experience to inform the future. Front Pharmacol. 2017;8:171.
11. Barham L. Transparently opaque: drug list prices versus net prices. Pharmaphorum. 2017. https://pharmaphorum.com/views-and-analysis/transparently-opaque-drug-list-prices-versus-net-prices/. Accessed 2 Jun 2019.
12. IQVIA Institute for Human Data Science. The global use of medicine in 2019 and outlook to 2023. 2019. p. 8. https://www.iqvia.com/institute/reports/the-global-use-of-medicine-in-2019-and-outlook-to-2023. Accessed 2 Jun 2019.
13. Abutaleb Y, Erman M. US senators tell drug company executives pricing is 'morally repugnant'. Reuters. 2019. https://www.reuters.com/article/us-usa-congress-drugpricing-idUSKCN1QF1WC. Accessed 2 Jun 2019.
14. Cohen J. Trump ready to force transparency in healthcare pricing with an executive order. Forbes. 2019 May 27. https://www.forbes.com/sites/joshuacohen/2019/05/27/trump-ready-to-force-transparency-in-healthcare-pricing-with-an-executive-order/#3f2f2c2e7636. Accessed 2 Jun 2019.
15. Pagliarulo N. Drug lobby aims to shake up how medicines are paid for. Biopharma Dive. 2018. https://www.biopharmadive.com/news/phrma-drug-lobby-proposes-shake-up-rebate-system-drugs/528084/. Accessed 21 Jul 2019.
16. Espin J, Schlander M, Godman B, Anderson P, Mestre-Ferrandiz J, Borget I, et al. Projecting pharmaceutical expenditure in EU5 to 2021: adjusting for the impact of discounts and rebates. Appl Health Econ Health Policy. 2018;16:803–17.
17. Government of Australia. Department of Health annual report 2018-19. p. 241. https://www.health.gov.au/sites/default/files/documents/2019/10/department-of-health-annual-report-2018-19_0.pdf. Accessed 7 Dec 2019.
18. Rebates fall but net PBS spending up. BioPharmaDispatch. 2018. [subscriber content with paywall]. https://pharmadispatch.com/news/rebates-fall-but-net-spending-up. Accessed 7 Dec 2019.
19. van Harten WH, Wind A, de Paoli P, Saghatchian M, Oberst S. Actual costs of cancer drugs in 15 European countries. Lancet Oncol. 2016;17(1):18–20.
20. Vogler S, Zimmermann N, Leopold C, Habl C, Mazag J. Discounts and rebates granted for medicines for hospital use in five European countries. Open Pharmacoeconomics Health Econ J. 2013;5:1–10.
21. Lobo F. Estadísticas de gasto farmacéutico: debemos mejorar. Blog Economia y Salud. 2018. http://www.aes.es/blog/2018/11/14/estadisticas-de-gasto-farmaceutico-debemos-mejorar/. Accessed 31 Jul 2019.
22. WHO. Pricing of cancer medicines and its impacts. Access to medicines, vaccines and pharmaceuticals technical report. 2018. https://apps.who.int/iris/bitstream/handle/10665/277190/9789241515115-eng.pdf?ua=1. Accessed 2 Jun 2019.
23. Report of the United Nations Secretary-General's High-Level Panel on Access to Medicines. 2016 Sep. https://static1.squarespace.com/static/562094dee4b0d00c1a3ef761/t/57d9c6ebf5e231b2f02cd3d4/1473890031320/UNSG+HLP+Report+FINAL+12+Sept+2016.pdf. Accessed 17 Nov 2019.
24. WHO. Fair Pricing Forum 2017 meeting report. 2017. https://www.who.int/medicines/access/fair_pricing/fair_price_report/en/. Accessed 21 Jul 2019.
25. WHO. Fair Pricing Forum 2019 meeting report. 2019. https://www.who.int/medicines/access/fair_pricing/fair_price_report_2019/en/. Accessed 21 July 2019.
26. Government of Italy. Improving the transparency of markets for drugs, vaccines and other health-related technologies. Submission to 2019 World Health Assembly, Knowledge Ecology International website. 2019. p. 1. https://www.keionline.org/wp-content/uploads/italy-draft-resolution-transparency-72WHA-.pdf. Accessed 17 Nov 2019.
27. Sagonowsky E. Despite reports from Merck and Johnson & Johnson, pharma's net prices 'likely not coming down': analyst. FiercePharma. 2018 Apr 10. https://www.fiercepharma.com/pharma/despite-pricing-disclosures-from-merck-and-j-j-pharma-s-net-prices-are-still-climbing. Accessed 2 Jun 2019.
28. Eli Lilly. 2017 integrated summary report. 2017. p. 22. https://assets.ctfassets.net/hadumfdtzsru/2Ayd5rsLd2AyMsQ8wY8wO0/79e2398c034863923b99098b53762406/2017_Lilly_Integrated_Summary_Report.pdf. Accessed 2 Jun 2019.
29. Janssen. Janssen US transparency report. 2018. https://transparencyreport.janssen.com/us/us-pharmaceutical-transparency-report. Accessed 2 Jun 2019.
30. Schechter A. Our pricing practices: under the microscope. Merck & Co. 2018. https://www.merck.com/about/perspectives/perspective-series-adam.html. Accessed 2 Jun 2019.
31. Government of the United States. Comparison of US and international prices for top Medicare Part B drugs by total expenditures. Assistant Secretary for Planning and Evaluation, Health and Human Services. 2018. https://aspe.hhs.gov/system/files/pdf/259996/ComparisonUSInternationalPricesTopSpendingPartBDrugs.pdf. Accessed 6 Dec 2019.
32. Access to Medicine Foundation. Access to Medicine Index. 2018. https://accesstomedicinefoundation.org/media/uploads/downloads/5cb9b00e8190a_Access-to-Medicine-Index-2018.pdf. Accessed 4 Aug 2019.
33. Access to Medicine Foundation. Are pharmaceutical companies making progress when it comes to global health? 2019. p. 34. https://accesstomedicinefoundation.org/media/uploads/downloads/5d93329e141cb_Access-to-Medicine-Index-10-Year-Analysis.pdf. Accessed 21 Jul 2019.

34. Global Health Progress. Explore Our Collaborations. International Federation of Pharmaceutical Manufacturers and Associations. Undated. https://globalhealthprogress.org/explore-our-collaborations/. Accessed 11 Jan 2020.
35. Cueni T. Fair pricing – striking the balance. Health Policy Watch. 2019. https://www.healthpolicy-watch.org/fair-pricing-striking-the-balance/. Accessed 21 Jul 2019.
36. Danzon P. Differential pricing of pharmaceuticals: theory, evidence and emerging issues. Pharmacoeconomics. 2018;36(12):1395–405. https://doi.org/10.1007/s40273-018-0696-4.
37. Danzon P, Towse A, Mestre-Ferrandiz J. Value-based differential pricing: efficient prices for drugs in a global context. Health Econ. 2015;24:294–301.
38. Ewen M, Joosse H, Beran D, Laing R. Insulin prices, availability and affordability in 13 low-income and middle-income countries. BMJ Glob Health. 2019;4(3):e001410. https://doi.org/10.1136/bmjgh-2019-001410.
39. Berdud M, Chalkidou K, Dean E, Ferraro J, Garrison L, Nemzoff C, et al. The future of global health procurement: issues around price transparency. Office of Health Economics Research Paper. 2019. https://www.ohe.org/publications/future-global-health-procurement-issues-around-pricing-transparency. Accessed 21 Jul 2019.
40. Persson U, Jonsson B. The end of the international reference pricing system? Appl Health Econ Health Policy. 2016;14(1):1–8. https://doi.org/10.1007/s40258-015-0182-5.
41. International AIDS Vaccine Initiative. Procurement and pricing of new vaccines for developing countries. Policy Brief. 2008;16:5. http://www.rho.org/files/IAVI_vaccine_procurement_pricing.pdf. Accessed 4 Dec 2019.
42. Lovelace Jr B, LaVito A. Trump says administration preparing an executive order on drug prices. CNBC. 2019. https://www.cnbc.com/2019/07/05/trump-administration-preparing-drug-price-executive-order.html. Accessed 6 Dec 2019.
43. Espin J, Rovira J, de Labry AO. Working paper 1: external price referencing—review series on pharmaceutical pricing policies and interventions. Geneva: World Health Organization and Health Action International; 2011. http://haiweb.org/wp-content/uploads/2015/08/ERP-final-May2011a1.pdf. Accessed 11 Jan 2020.
44. Kanavos P, Fontrier AM, Gill J, et al. The implementation of external reference pricing within and across country borders. London: London School of Economics; 2017. https://doi.org/10.21953/lse.y1tbizsxrl3n.
45. Kanavos P, Fontrier AM, Gill J, et al. The impact of external reference pricing within and across countries. London: London School of Economics; 2017. https://doi.org/10.21953/lse.m0bluqcv10g6.
46. Remuzat C, Urbinati D, Mzoughi O, et al. Overview of external reference pricing systems in Europe. J Mark Access Health Policy. 2015;3:27675. https://doi.org/10.3402/jmahp.v3.27675.
47. Panteli D, Francis A, Cleemput I, et al. Pharmaceutical regulation in 15 European countries: review. Health Syst Transit. 2016;18(5):1–118.
48. Csanádi M, Kaló Z, Prins C, et al. The implications of external price referencing on pharmaceutical list prices in Europe. Health Policy Techn. 2018;7(3):243–50. https://doi.org/10.1016/j.hlpt.2018.07.005.
49. Leopold C, Mantel-Teeuwisseb AK, Vogler S, et al. Is Europe still heading to a common price level for on-patent medicines? An exploratory study among 15 Western European countries. Health Policy. 2013;112(3):209–16.
50. Toumi M, Remuzat C, Vataire AL, Urbinati D. External reference pricing of medicinal products: simulation-based considerations for cross-country coordination. Final report. 2014. https://ec.europa.eu/health/sites/health/files/healthcare/docs/erp_reimbursement_medicinal_products_en.pdf. Accessed 11 Jan 2020.
51. OECD. Recommendation of the OECD Council on fighting bid rigging in public procurement. Paris: OECD; 2012. p. 8. http://www.oecd.org/daf/competition/RecommendationOnFightingBidRigging2012.pdf. Accessed 21 Jul 2019.
52. OECD. Executive summary of the roundtable on excessive prices in pharmaceutical markets. Paris: OECD; 2018. p. 4. https://one.oecd.org/document/DAF/COMP/M(2018)2/ANN5/FINAL/en/pdf. Accessed 21 Jul 2019.
53. European Commission. Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal cooperation agreements. Communication from the Commission, 2011/C 11/01. 2011. p. 17. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011XC0114(04). Accessed 5 Dec 2019.
54. US Federal Trade Commission. Amendments to the Minnesota Government Data Practices Act regarding health care contract data. 2015. p. 6. https://www.ftc.gov/system/files/documents/advocacy_documents/ftc-staff-comment-regarding-amendments-minnesota-government-data-practices-act-regarding-health-care/150702minnhealthcare.pdf. Accessed 5 Dec 2019.
55. Sanger-Katz, M. Why transparency on medical prices could actually make them go higher. New York Times. 2019. https://www.nytimes.com/2019/06/24/upshot/transparency-medical-prices-could-backfire.html. Accessed 5 Dec 2019.
56. Albaek S, Mollgaard P, Overgaard P. Government-assisted oligopoly coordination? A concrete case. J Ind Econ. 1997;45(4):429–43. https://doi.org/10.1111/1467-6451.00057.
57. Luco F. Who benefits from information disclosure? The case of retail gasoline.Department of Economics, Texas A&M University; 2018. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3186145. Accessed 5 Dec 2019.
58. Georgantzis N, Sabater-Grande G. Market transparency and collusion: on the UK agricultural tractor registration exchange. Eur J Law Econ. 2002;14:129. https://doi.org/10.1023/A:1016554808648.
59. Stigler G. A theory of oligopoly. J Political Econ. 1964;72(1):44–61.
60. Schmalensee R. On a level with dentists?: Reflections on the evolution of industrial organization. Rev Ind Organ. 2012;41:157–79. https://doi.org/10.1007/s11151-012-9356-6.
61. Schultz C. Collusion in markets with imperfect price information on both sides. Rev Ind Organ. 2017;50(3):287–301. https://doi.org/10.1007/s11151-016-9539-7.
62. Thomas S. Harmful signals: cartel prohibition and oligopoly theory in the age of machine learning, forthcoming. J Compet Law Econ. Epub 2019 Jun 10. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3392860. Accessed 5 Dec 2019.
63. OECD. Excessive prices in pharmaceutical markets: background note by the Secretariat. Paris: OECD; 2018. https://one.oecd.org/document/DAF/COMP(2018)12/en/pdf. Accessed 21 Jul 2019.
64. Love J. KEI statement on adoption of the WHA72 Transparency Resolution. Knowledge Ecology International; 2019. https://www.keionline.org/30887. Accessed 21 Jul 2019.
65. MSF. Transparency matters. 2019. https://msfaccess.org/TransparencyResolution. Accessed 21 Jul 2019.
66. European Commission. Transparency Directive. https://ec.europa.eu/growth/sectors/healthcare/competitiveness/products-pricing-reimbursement/transparency-directive_en. Accessed 4 Dec 2019.
67. Government of Australia. Australia-United States Free Trade Agreement: chapter 2—national treatment and market access for goods. Department of Health. https://dfat.gov.au/about-us/publications/trade-investment/australia-united-states-free-trade-agreement/Pages/chapter-two-national-treatment-and-market-access-for-goods.aspx. Accessed 7 Dec 2019.
68. Office of US Trade Representative. Korea-US Free Trade Agreement final text. Chapter 5: pharmaceuticals and medical devices,

as at 1 January 2019, https://ustr.gov/sites/default/files/uploads/agreements/fta/korus/asset_upload_file899_12703.pdf. Accessed 7 Dec 2019.
69. European Commission. Health technology assessment, https://ec.europa.eu/health/technology_assessment/key_documents_en. Accessed 4 Dec 2019.
70. Busse R, Orvain J, Velasco M, Perleth M, Gurtner F, Jorgensen T, et al. Best practice in undertaking and reporting health technology assessments. Int J Technol Assess Health Care. 2002;18:361–422.
71. Drummond M, Schwartz J, Jönsson B, Luce B, Neumann P, Siebert U, et al. Key principles for the improved conduct of health technology assessments for resource allocation decisions. Int J Technol Assess Health Care. 2008;24:244–58.
72. Canconnan T, Fuster M, Saunders T, Patel K, Wong JB, Leslie L, et al. A systematic review of stakeholder engagement in comparative effectiveness and patient-centred outcomes research. J Gen Intern Med. 2014;29:1692–701.
73. Oortwijn W, Jansen M, Baltussen R. Evidence-informed deliberative processes: a practical guide for HTA agencies to enhance legitimate decision-making. Version 1.0. Nijmegen: Radboud University Medical Centre, Radboud Institute for Health Sciences. 2019.
74. Thokala P, Devlin N, Marsh K, Baltussen R, Boysen M, Kalo Z, et al. Multiple criteria decision analysis for health care decision making—an introduction: report 1 of the ISPOR MCDA Emerging Good Practices Task Force. Value Health. 2016;19:1–13.
75. Gleeson D, Lopert R, Papaarangi R. How the Transpacific Partnership Agreement could undermine PHARMAC and threaten access to affordable medicines and health equity in New Zealand. Health Policy. 2013;112:227–33.
76. Diariofarma. El Tribunal de Cuentas pide a Sanidad procedimientos para las evaluaciones. 2017. https://www.diariofarma.com/2017/01/12/tribunal-cuentas-pide-sanidad-procedimientos-las-evaluaciones. Accessed 4 Dec 2019.
77. Branigan D. Drug R&D, sexual & reproductive health scrutinised in draft UHC Declaration. Health Policy Watch. 2019. https://www.healthpolicy-watch.org/drug-rd-sexual-reproductive-health-scrutinised-in-draft-uhc-declaration/. Accessed 4 Aug 2019.
78. Bullement A, Taylor M, McMordie ST, et al. NICE, in confidence: an assessment of redaction to obscure confidential information in single technology appraisals by the National Institute for Health and Care Excellence. Pharmacoeconomics. 2019;37:1383–90. https://doi.org/10.1007/s40273-019-00818-0.
79. Love J. KEI statement on adoption of the WHA72 transparency resolution. Knowledge Ecology International. 2019. https://www.keionline.org/30887. Accessed 5 Dec 2019.
80. Government criticised over 'recklessly watering down' pharma resolution. Morning Star. 2019. https://morningstaronline.co.uk/article/b/government-criticised-over-recklessly-watering-down-pharma-resolution. Accessed 5 Dec 2019.
81. Health DG. Global drug price transparency resolution a start but more needed. The Star Online. 2019. https://www.thestar.com.my/news/nation/2019/05/29/health-dg-global-drug-price-transparency-resolution-a-start-but-more-needed/. Accessed 5 Dec 2019.
82. World Health Assembly adopts resolution over transparent drug pricing to mixed reviews. STAT. 2019. https://www.statnews.com/pharmalot/2019/05/28/drug-prices-transparency-world-health-assembly/. Accessed 5 Dec 2019.