


# Socioecological factors linked with pharmaceutical incentive-driven prescribing in Pakistan

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## ABSTRACT

Pharmaceutical marketing through financial incentivisation to general practitioners (GPs) is a poorly studied health system problem in Pakistan. Pharmaceutical incentivisation is seen to be distorting GPs prescribing behaviour that can compromise the health and well-being of patients. We draw on a conceptual framework outlined in the ecological system theory to identify multiple factors linked with pharmaceutical incentivisation to GPs in Pakistan. We conducted qualitative interviews with 28 policy actors to seek their views on the health system dynamics, how they sustain pharmaceutical incentivisation and their effect on the quality of care. Our analysis revealed four interlinked factors operating at different levels and how they collectively contribute to pharmaceutical incentivisation. In addition to influences such as the increasing family needs and peers' financial success, sometimes GPs may naturally be inclined to maximise incomes by engaging in pharmaceutical incentivisation. On other hand, the pharmaceutical market dynamics that involve that competition underpinned by a profit-maximisation mindset enable pharmaceutical companies to meet GPs' desires/needs in return for prescribing their products. Inadequate monitoring and health regulations may further permit the pharmaceutical industry and GPs to sustain the incentive-driven relationship. Our findings have important implications for potential health reforms such as introducing regulatory controls, and appropriate monitoring and regulation of the private health sector, required to address pharmaceutical incentivisation to GPs.

## INTRODUCTION

Pakistan's health system is composed of public and private sectors.<sup>1</sup> Constitutionally, the federal and provincial governments are primarily responsible for healthcare provision in the country, but weak governance and poor resource allocation contribute to a greater dependency on the private sector.<sup>2</sup> A large part of the private sector includes the small-scale primary healthcare clinics run by general practitioners (GPs) whom the pharmaceutical

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Pharmaceutical incentivisation distorts physicians' prescribing behaviour.
- ⇒ Profit-led prescribing affects patients' health and well-being.

## WHAT THIS STUDY ADDS

- ⇒ Multiple interlinked factors contribute to pharmaceutical incentivisation.
- ⇒ Conflict of interest arising from incentives and how it shapes prescribing behaviour.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Multifaceted interventions are required to address multiple problems linked with incentivisation.
- ⇒ Research with general practitioners is required to explore the reasons behind engagement in profit-led prescribing.

industry builds collaborations with to maximise profits.<sup>3</sup>

There is evidence that pharmaceutical companies often provide GPs with various incentives for prescribing their pharmaceutical products.<sup>3–5</sup> Our previous research from Pakistan identifies a range of incentives that GPs take from pharmaceutical companies, including money (in the form of cash/cheque), items for clinic/home renovation (ie, clinical equipment, air conditioning units and furniture) and sponsorships for leisure trips and for attending local/international academic events.<sup>6</sup> Pharmaceutical incentivisation often leads to conflicts of interest in medical practice, as personal gains from pharmaceutical companies in return for prescribing may compromise GPs' professional judgement and their responsibility to consider patients' health and well-being.<sup>7</sup> Hence, GPs who are under a burden of reciprocity with pharmaceutical companies may prescribe expensive and/or unnecessary medicines, even when less expensive alternatives are

available in the market.<sup>8</sup> GPs may also prescribe antibiotics for ailments like cold and influenza that are self-resolving. This has implications for antimicrobial resistance (AMR), which happens when microbes evolve mechanisms that protect them from the effects of antibiotics, making infections harder to treat.<sup>9 10</sup>

The synthesis of research into pharmaceutical incentivisation indicates several factors operating at different levels that contribute to this practice. For instance, many studies draw a linkage between pharmaceutical incentivisation with unclear laws/policies and weak regulation, with some studies also referring to bad governance and institutional corruption.<sup>4 11 12</sup> Other studies focus more on the pharmaceutical market dynamics and how the increased use of money and power held by it, neutralises laws/guidelines/policies regarding ethics in pharmaceutical marketing and medical practice.<sup>13 14</sup> Studies also point to GPs' lack of awareness of drug effects on the human body, AMR and to ethics in medical practice and how these factors lead GPs to engage in pharmaceutical incentivisation.<sup>15–17</sup> Our study builds on this international research to analyse multiple factors linked with pharmaceutical incentivisation to GPs in Pakistan and the implications of this practice for patients' health and well-being. To better analyse GPs' engagement in pharmaceutical incentivisation, it is important to draw on a conceptual framework that helps to tease out factors operating at different levels. To do so, we use Bronfenbrenner's<sup>18</sup> ecological system theory to identify micro, meso, exo and macro factors linked with incentive-driven prescribing among GPs.

## THEORETICAL FRAMEWORK

Bronfenbrenner's ecological system theory is well suited to analyse socioecological factors/conditions that influence human behaviour.<sup>19</sup> Bronfenbrenner<sup>18</sup> argues that the characteristics of individuals' behaviour can be understood as a joint function of his/her personal and (social) environmental characteristics. He identifies four interlinked systems that collectively act on individuals' behaviour. A microsystem entails a pattern of activities, roles and interpersonal relations associated with individuals. Mesosystem is comprised of somewhat distant relationships in society such as with peers. An exosystem can be understood as conditions which may be indirectly linked to individuals and have effects on them. We consider the pharmaceutical market dynamics and how they influence prescribing practices as an exosystem in this study. Finally, a macrosystem is defined as consistencies at the level of culture or subculture underpinned by a belief system or ideologies. Macrosystem factors may include laws, policies and societal norms.

## METHODS

### Study design and participants

We adopted a qualitative approach to obtain policy actors' (PAs) perspectives on pharmaceutical incentivisation to private GPs and how this might distort GPs' prescribing practices in Pakistan. We define private GPs as individuals

**Table 1** Participants' characteristics

Participants	Gender	
	Male	Female
Officials from regulatory institutions	4	2
Former officials from MoH	2	–
Pharmaceutical company executives	3	2
Pharmaceutical research consultant	1	–
NGO executives	3	1
Members of professional associations	4	–
Media and communication experts	3	–
Ethicists	1	1
Health promotion expert	1	–
	22	06
Total	28	

MoH, Ministry of Health; NGO, non-governmental organisation.

with a Bachelor of Medicine and Bachelor of Surgery qualification (MBBS) and who provide primary health-care in private clinics. As shown in [table 1](#), PAs were individuals who had some influence on health policy, directly or indirectly, such as health regulators, former officials of the Federal Ministry of Health (MoH), executives from pharmaceutical companies and non-governmental organisations (NGOs), physicians and pharmacists from various professional associations and health promotion and media/communication experts.

### Recruitment and data collection

Adopting purposive and snowball sampling techniques, we recruited 28 PAs in our study to gather information on the level of their awareness regarding pharmaceutical incentivisation and their perspectives on factors contributing to this practice. PAs were well suited to give information of this sort, as they were experienced individuals working in various health-related domains, such as health policy, regulation, communication, advocacy and research. Therefore, they might better explain what drives pharmaceutical incentivisation in Pakistan and problems with the regulation of the private health market and the pharmaceutical industry. We first purposively identified and recruited a few PAs through our professional network built from previous and ongoing research collaborations in Pakistan.<sup>17</sup> We then snowballed to identify other PAs through the initial interviews, whereby each participant connected us with other professionals in their network. Due to the sensitive nature of the topic, we used vignettes (online supplemental file 1) indicating various scenarios of conflict of interests (COI) arising from incentivisation, to conduct the interviews (see [box 1](#)). The vignettes were built on a successful methodology applied as part of our policy analysis in Pakistan, which was recognised as an important new method—rooted in theoretical work on governance, social construction and the policy process in LMIC—that enabled a structured approach to collect

**Box 1**

- ⇒ General practitioners (GPs) asking patients to buy medicines from their friend's shop, so the GPs can get a percentage of the sales of every medicine.
- ⇒ GPs prescribing medicines for a specific pharmaceutical company receives money when they meet its sales each month.
- ⇒ GPs prescribing medicines because a pharmaceutical company gives them a voucher to take his family to a nice restaurant when they meet its targets.
- ⇒ GPs prescribing medicines, so that a pharmaceutical company will pay for them to attend a conference that they cannot afford to pay for themselves.
- ⇒ GPs prescribing antibiotics because they are afraid that if they give the patient no antibiotic the patient will be unsatisfied and tell others in the community not to visit their clinics.

rich qualitative data.<sup>17</sup> We sought PAs' views on GPs' behaviour from each scenario in the vignette to understand how they analyse those behaviours from a medical ethics lens.

During the interviews, we paid great attention to how PAs' positions relate to vested interests, particularly when analysing whether PAs were less critical of certain behaviours. We also focused on whether government PAs' support for harder regulatory approaches increased since our earlier research, following changes in the ruling political party and MoH. All the interviews were audio-recorded, with each of them lasting approximately 60 min. To be efficient with time, we assigned an external vendor to transcribe the audio-recorded interviews, as the data collection went on. To ensure the quality, the core research team listened to all the interview recordings and reviewed the transcriptions. In this way, the process of analysing the data began at the fieldwork stage—as the research team reviewed the transcripts, it discussed emerging themes to make sense of the data.

**Data analysis**

On completion of data collection, we exported all the transcripts to NVivo (V.12) to develop codes and organise them in three major themes: health system and regulation, the influence of the pharmaceutical industry and pharmaceutical incentivisation and consequences. To maintain confidentiality, while quoting excerpts from the interviews, we masked the individual identities of participants by assigning them unique codes, generated through a combination of the initials of the interviewee category, name and the number of the interview.

**Patient and public involvement**

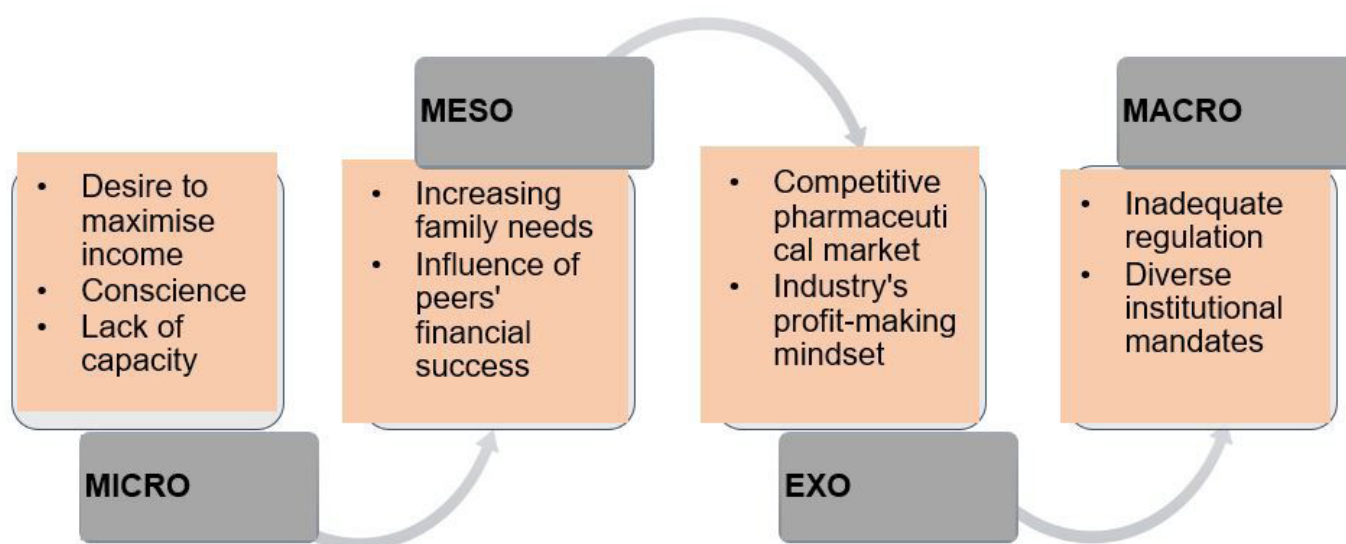
None.

**RESULTS**

Almost all the participants viewed the vignette-based scenarios as examples of unethical medical practice. Participants said they were aware that taking incentives from pharmaceutical companies for prescribing medicines was a common practice in the private health sector. As shown in [figure 1](#), we classified factors that participants believed might lead to pharmaceutical incentivisation as micro, meso, exo and macrofactors. Following the identification of the factors, we present an analysis of how pharmaceutical incentivisation to GPs negatively impacts patients' health and well-being.

**Micro/individual-level factors**

Many PAs believed that GPs' personal characteristics often determine their engagement in pharmaceutical incentivisation, particularly their conscience (individuals' moral sense to differentiate between right and wrong). A provincial-level health regulator believed greed might neutralise GPs' knowledge about ethics in medical practice, and they might adopt methods like relying on pharmaceutical incentivisation to generate additional income:



**Figure 1** Socioecological factors linked with incentive-driven prescribing.

When a person becomes greedy, he does not remember what he has been taught. I am not saying this about all, but some doctors do malpractice. It depends on people's conscience (PA-19).

A few participants believed a lack of capacity in the public health sector generally allows the private sector to continue to expand, which is based on a profit-making model. An executive from an NGO described GPs might not be just considered healthcare providers but also entrepreneurs who might want to maximise their incomes:

Doctors turn into daily wage labourers and due to their greed, they just want to make money. With this kind of attitude, it is easier for them to indulge themselves in such practices (PA-08).

Some participants reported medical schools often have a diverse range of students. After graduation, the top tier might want to seek a career in high-income countries like USA and UK, the second tier might pursue a postgraduation within Pakistan and become specialists, whereas the third tier often involves doctors with limited chances of specialisation, often opt to become GPs. Therefore, to compete with other successful doctors, GPs might rely on pharmaceutical incentivisation, so they could compete with other successful doctors in terms of financial resources. A health promotion expert and a former family physician believed that sometimes GPs to compete with consultants (in terms of wealth) are more likely to rely on pharmaceutical incentives, for which they may not adhere to good medical practices:

Now when they have to compete, in a place where they have to fire a bullet, they fire a bomb, so that they become better known. And that's how, instead of using simple antibiotics or rationally using antibiotics, they have jumped to using third generation Cephalosporins or things like that immediately, which has led to this massive microbial resistance (PA-22).

An executive from an NGO thought GPs who engage in pharmaceutical incentivisation and overprescribing of antibiotics might have limited knowledge of its effects on patients' health and well-being:

The concept of quality is new in Pakistan, and we don't have a competent workforce for it. For practitioners, it is new also, so they don't have any idea. The same is with the quality professionals who are working right now who do not have the competency to work as quality professionals because we don't have structured training on quality, we don't have a body which is providing the training or something like that. Those working on the quality control boards are not qualified quality care practitioners. So, you don't expect them to implement all these standards in a complete sense which were expected to be implemented (PA-08).

### Meso/interpersonal-level factors

Many interviews suggested that GPs' relationships at an interpersonal level (with family, friends and peers) could also influence them to think of maximising incomes from

their medical practice. A few participants said that GPs who do not work in public sectors rely solely on their private practice might be more likely to engage in pharmaceutical incentivisation when they experience pressure to meet increasing family needs. Thus, an ethicist pointed to how a lack of career structure in the country coupled with GPs' increasing family needs might contribute to their engagement in pharmaceutical incentivisation

The reality is very different; doctors have to look after their families and make ends meet. There are no career structures for any doctor in Pakistan other than the government institutions in which it is very difficult to get a job (PA-16).

A researcher in pharmaceutical marketing believed that due to continued financial pressures resulting from family needs, GPs constantly look for options to generate income in addition to their regular earnings from clinical practice:

Despite difficulties, families pay for kids' MBBS, and when you accomplish that you experience an inferiority complex due to less-than-expected income. By the time you have done FCPS [Fellow of the College of Physicians and Surgeons of Pakistan], their age is 40 to 45 years. So, they assume that just take it wherever the money is coming from (PA-02).

A female executive from a large pharmaceutical company talked about how successful peers could influence GPs to maximise incomes, for which they engage in pharmaceutical incentivisation:

Some doctors see their peers growing and having a luxurious life, and you know, so then sometimes that pressure makes them move to a different zone and not be concerned about patients. I think several factors like economic pressure, social pressure, then lack of adequate training, then possible preferences or upbringing or background where he or she is coming from, maybe very weak background, so obviously, the need for money will propel him/her to obviously to indulge in unethical things (PA-07).

### Exo/contextual factors

Most of the participants believed that with the increase in competition in the pharmaceutical market, companies began to introduce incentivisation as a major marketing tool, which further leads to incentive-driven prescribing. An official from a federal-level regulatory institution thought pharmaceutical incentivisation linked with prescriptions not only enabled GPs to generate additional income/resources but also help pharmaceutical companies to maximise sales of pharmaceutical products:

As the number of companies grew, it brought competition, and this is where things began to shift. Some people say multinational companies are ethical, but I don't think they are; if they don't give money, they would give other things to compensate doctors, especially foreign trips (PA-17).

A former official from the federal ministry of health described to compete in the local pharmaceutical market,

the companies came up with various tactics to increase sales, indicating a capitalistic motive, where patient well-being was completely ignored:

In the past, we have seen a huge growth in supplements, particularly vitamin C, having different funny brand names. It was quite scandalous, as it was outside the purview of the DRAP's [Drug Regulatory Authority of Pakistan] price control. Where each tablet of vitamin C cost 1 rupee, it was priced at 100 rupees. I mean even though the tablet had the same ingredients, the price went up and was justified by the companies (PA-03).

By concentrating more on financial power, a health regulator believed the industry penetrated other social spheres and used them in their capitalistic interest. For instance, one participant spoke about how a pharmaceutical company used religious figures to normalise the incentives-driven relationship between the industry and GPs:

People from a leading pharmaceutical company, I shall not name it, seem to be quite religious. They managed to have a fatwa [an order issued by a Muslim religious leader] that doctors' attainment of extra money as a return for prescribing specific pharmaceutical products is permissible from a religious point of view, as the incentives are a product of a business partnership between the doctors and the companies. For example, if a company wants to have a sale of a million rupees in a city, it will partner with the doctors in that city, and give them a specific share of the money, for prescribing (PA-17).

Another health regulator believed in addition to religion, the industry had strong connections in political circles, and could use them, when necessary:

I must be very upright, but careful in saying that if you fight them, it is going to be very problematic. They would call the chief minister, the secretary, and other political councils and get support. Even if we tell them the specific medicines are not useful, or even dangerous, they will say, if it has acceptability from others, why not from you, and then we are not able to oppose it anymore. So, they are giants (PA-19).

A member of a professional medical association believed that the pharmaceutical industry is powerful enough to influence the law. Hence, there has been a lack of punishment for the industry's unethical marketing, something that reinforces its power on the health system:

There is no punishment for what they do. Have you ever seen somebody being punished for manufacturing and selling drugs inappropriately? Although there is the law of 1956, the courts do not use it to penalise. Indeed, the courts dismiss their cases and set them free (PA-13).

### Macro/policy-level factors

Most of the participants talked about weak governance and regulation of the broader health system, a lack of legislation and policies regarding ethics in medical practice and how they collectively contribute to the problem of pharmaceutical incentivisation. Another former

official from the federal ministry of health believed that addressing profit-led prescribing in the country was a complex challenge mainly due to the weak regulation of its health system:

In mixed health system arrangements, in lower and middle-income countries where we do not have proper regulation and strategic purchasing by the public sector, these problems continue to prevail. Now, from the system perspective, a very important thing is that in a country like Pakistan, where private health care is much bigger than the public sector. Then ultimately if we want to further expand universal health services and social health services (PA-11).

A drug regulator spoke about the absence of a prescription control system and how this permits pharmaceutical companies and GPs to maintain their incentives-driven relationship:

The main thing is that we do not have a prescription control system, and even if we have one, we can control GPs, but what about over-the-counter medications, it will then need something else to be controlled, otherwise the out-of-pocket spending will continue to increase (PA-17).

He further indicated diverse mandates and a lack of coordination between federal and provincial regulatory bodies might also play out to sustain pharmaceutical incentivisation to GPs:

DRAP mainly regulates the pharmaceutical industry: pharmaceutical manufacturing, its import and export, but provincial governments are responsible to look at their sales, according to the drug act. The drug regulatory authority is involved in this process too but in a limited capacity. Nobody can deny unethical pharmaceutical promotions, and even being a regulator, I say, this happens and may be at a very large scale compared with other countries. We are often asked why we cannot control this practice. I again say, our authority is limited particularly when it comes to GPs; we cannot say anything directly to them. We have the Pakistan Medical Commission now, which has replaced the Pakistan Medical and Dental Council. Maybe this is something for them to consider more seriously, as this is mandatory for GPs to get registered with PMC to perform clinical practice (PA-17).

An executive from another NGO said it even becomes difficult to report malpractices in healthcare settings due to the absence of a vertical health regulation structure:

After devolution, there hasn't been any, you know, the vertical structure where the consumer knows where to go and where to make the complaint and get the redress. Then there have been the regulations so the drug laws at the federal level and then at the provincial laws, you know, there has been some implementation, we'll see it over there, who is good with doing what. So, you know if the consumer wants to have relief, then that would be a tough thing (PA-21).

### Implications for patients' health and well-being

Weak health regulation, and competition in the pharmaceutical market, coupled with the individual-level

and interpersonal-level influences on GPs, can together contribute to incentive-driven prescribing that has consequences for patients' health and well-being. On the other hand, a lack of awareness among patients about health and illness can make it easier for GPs to exploit them with incentive-driven prescribing. A health regulator said:

The poor souls are usually powerless, specifically when they are illiterate. Whatever the doctors prescribe to them, they will follow it, and will never complain (PAG-10).

A former official from the federal ministry of health also indicated how GPs used polypharmacy to be able to meet sales targets for pharmaceutical companies, and how this is often encouraged by patients who judge good GPs based on how many medicines they can prescribe:

Due to psycho-social-cultural barriers, GPs deliberately write seven and eight things on the pad, so it looks like a good range of medicines (PA-19).

He went on to describe that having a certain level of power in the health system, along with collaborations that centre around mutual financial interests, GPs prescribing practices pose a risk to professional ethics and patients' well-being:

I would say that the moral position is not seen to be at risk if patients are not harmed. For instance, if patients are prescribed multivitamins and even if they do not need them, apparently there is no harm to the patients' health from taking them. Indeed, you will look foolish if you do rational prescribing, as meeting patients' desire to have medication is equally important (PA-03).

Many participants also indicated how the money-driven collaboration between GPs and the pharmaceutical industry has significant implications in terms of an increased financial cost of healthcare to patients. A health regulator said:

As far as patients get immediate relief with medicines that GPs prescribe, they should be okay with that and not think about why the doctor asked to buy those medicines from a specific pharmacy. If they find improvement in their health, they would be happy to buy medicines that cost 1500 rupees, no matter if alternates costing 500 rupees are available (PA-19).

## DISCUSSION

In this paper, we identified how individual, interpersonal, contextual and structural factors worked together to produce conditions in which pharmaceutical incentivisation to private GPs happened. An important contribution of our study is its exposition of micro/individual-level factors shaping GPs' tendency to obtain benefits from pharmaceutical companies. Existing research has largely focused on the profit-oriented mindset of the pharmaceutical industry in driving profit-led prescribing.<sup>20–22</sup> We found that institutional corruption can work together with GPs' dispositions and unmet needs to enable profit maximisation through prescribing. Honesty, integrity,

health promotion, friendliness and sincerity with patients are generally seen to be elements that may constitute GPs moral commitment in good medical practice.<sup>23</sup> A poor physician may not only be characterised by inadequate knowledge and skills in medicine but also the one who possesses negative tendencies/intentions, which are not in patients' best interest.<sup>24</sup> Our data give a clear indication of how participants believed private GPs in Pakistan often give more importance to money, and this profit-making mindset generates the desire to obtain extra resources from pharmaceutical companies, which may happen at the expense of patients' health and well-being.

GPs who might not get a chance to receive a postgraduate qualification might end up doing general practice in private small-scale clinics, where income generation might be limited. At the same time, increasing family needs in combination with socially desired standards of living might lead them to cogenerate income from pharmaceutical companies. Indeed, GPs in various parts of the world are seen to be earning less money than hospital consultants, and, hence, accumulate less wealth over their lifetime.<sup>25</sup> Our findings support the view that GPs may likely engage in pharmaceutical incentivisation to address various unmet needs.<sup>26</sup> We also found examples of how GPs' desire to maximise incomes might be influenced by their social relationships at an interpersonal level. This finding is in alignment with the proposition that GPs represent a close-knit community that can have a critical effect on members' behaviour.<sup>27</sup>

Our analysis also highlights conditions which may be external to GP practice but may indirectly exert influence on their prescribing practices. For instance, the growing competition and local pharmaceutical market make space for the mobilisation of incentives to secure GPs' support to enhance pharmaceutical sales, a finding which aligns with reports from various international studies.<sup>28–29</sup> In Pakistan, more than 600 pharmaceutical companies are registered with the Drug Regulatory Authority of Pakistan (DRAP).<sup>30</sup> While no law restricts GPs from using brand medicine names in their prescriptions, DRAP suggests GPs use generic names.<sup>31</sup> Nevertheless, these guidelines are not enforced, and medicines in the country are frequently prescribed using brand names, allowing pharmaceutical companies to openly incentivise private GPs that prescribe their products.<sup>32</sup> Thus, GPs' needs or their desire to maximise incomes and the industry's profit-maximisation mindset intersect to produce a context in which pharmaceutical incentivisation becomes normalised.

Health regulation involves safeguarding people's health and well-being by detecting and addressing malpractice within the healthcare system through laws/policies and their implementation.<sup>33</sup> In Pakistan, the diverse mandates possessed by federal and provincial regulatory bodies, together with institutional corruption makes it difficult to enforce health regulation. Hence, the competing centres of power may dilute the centrality of the health system, which further contributes

to the constrained regulation of the pharmaceutical industry and GPs.<sup>34</sup> GPs' engagement in pharmaceutical incentivisation certainly threatens professional ethics in medical practice and patients' well-being and contributes to an increased financial burden on the health system. The application of ecological system theory has also allowed us to unveil how a lack of focus (by institutions) and awareness (among GPs) on quality of care may also contribute to GPs' engagement in pharmaceutical incentivisation. Quality of care has been defined in different ways but general elements that can ensure quality in healthcare delivery may encompass affordability, transparency in medical processes, the effectiveness of medical/interpersonal care and accessibility to healthcare services and structures.<sup>35</sup> In Western settings, formal institutions (such as the Royal College of General Practitioners in the UK) operate to give GPs continued education that helps them to ensure the quality of care at both medical and interpersonal levels.<sup>36</sup> Because general practice is seen to be less complicated than other medical specialities, the country fails to engage GPs in continued formal training, and, hence, lacks a workforce, competent enough to recognise the negative effects of taking pharmaceutical incentives. Indeed, the College of Family Medicine in Pakistan provides training in family medicine, but training slots are limited, and many graduates cannot afford to undergo further training.

Once GPs accept incentivisation offers from pharmaceutical companies, they confront COI in their medical practice, whereby meeting pharmaceutical sales targets through prescriptions takes primacy on patients' health and well-being.<sup>7</sup> Ideally, physicians should be objective in prescribing medications to ensure that the consumption of the medications can meet their patients' health needs.<sup>37</sup> Pharmaceutical incentives can jeopardise physicians' objectivity, as the consideration of personal interests (ie, financial benefit), physicians may prescribe unnecessary or more expensive medications to patients.<sup>5</sup> There is evidence that through profit-led prescribing physicians in many countries have been even prescribing antibiotics for common self-resolving ailments, which has important implications for antibiotic resistance.<sup>38–40</sup>

Our study results also have important implications for health policy and regulation. In 2021, the DRAP published guidelines on ethical pharmaceutical marketing according to which incentivisation to GPs would be considered illegal.<sup>31</sup> We take this development as an important way to address one of the macrolevel problems analysed in this study. Hence, the main contribution of our study is its exposition of factors operating at different levels, and how this analysis can help policymakers and regulators to devise ways to address various contributors to profit-led prescribing. Discussion with PAs in our study suggests that implementation of an electronic prescription monitoring control system may help regulate physicians' prescribing behaviour. However, actions are also required to regulate the size

of the pharmaceutical industry. Presence of small-scale local pharmaceutical companies adds to the competition in the market, further contributing to pharmaceutical incentivisation. Additionally, training on professional ethics as part of continuing medical education is likely to be an effective way to provide constant reminders about ethical guidelines that exist in the country. The bottom line is that there is a dire need for the implementation of strict regulations and constant monitoring and education to make the pharmaceutical relationship more transparent and ethical.

### Study limitations

The analysis of microlevel and mesolevel factors is based on PA interviews and might not entirely align with GPs' perspectives. Hence, qualitative interviews with GPs could have strengthened this analysis. Similarly, a greater number of female PAs in our sample might have brought more insights. However, the fewer female PAs in the sample reflect the broader patriarchal social structure of Pakistan, classifying social roles in a way that men are meant to work, while women are typically expected to manage households. It is also important to note that while this study focused on GPs, and data shared are limited to this group of health practitioner. Incentivisation is also prevalent among other healthcare providers (both formal as well as informal); however, those groups were not included in this study. Future studies should consider examining the factors linked with the absence of clear parameters to measure the quality of care in the Pakistani health system. Research on federal and provincial-level regulatory bodies that can analyse the feasibility of the development/use of quality-of-care parameters could be an important contribution. Furthermore, the analysis of barriers to effective communication and collaboration between the federal and provincial health regulatory bodies can be critical in identifying solutions for better healthcare regulation. The insights obtained from these potential studies can help to co-design interventions useful to reduce the problem of pharmaceutical incentivisation.

### CONCLUSION

In this paper, we have provided an analysis of how the entanglement between individual, interpersonal, contextual and structural-level factors contributes to and sustain the incentive-driven relationship between the pharmaceutical industry and GPs. The most important aspect of our analysis is the exposition of the absence of quality-of-care parameters and how this allows GPs to give primacy to personal gains over patients' best interests. In Pakistan, the private sector plays a crucial role in delivering healthcare to almost 80% of the population. This implies that distortion of GPs' prescriptions through pharmaceutical incentivisation can affect a large proportion of the population, and,

hence, achieving good quality of care can continue to be a problem, unless profit-led prescribing is addressed. This goal can be achieved through providing continued formal education on medical ethics and quality of care and strengthening health regulation which can further help to GPs reduce profit-led prescribing.

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**Contributors** MK, MNN and SS have conceived the study. MNN has contributed to design development, contributed to data collection, performed the main analysis and drafted the first manuscript and subsequent revisions, and is the guarantor. MK, SS, RH and AR-S contributed to the data analysis. WA and MK contributed to data collection. MK, RH, SS, AR-S, WA and ARS contributed equally by critically reviewing and revising the proposal.

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**Patient consent for publication** Consent obtained directly from patient(s)

**Ethics approval** This study involves human participants and was approved by Pakistan National Bioethics Committee (number 4-87/NBC-582/21/1364) Aga Khan University (number 2020-4759-1129) London School of Hygiene and Tropical Medicine (number 26506). Participants gave informed consent to participate in the study before taking part.

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**Data availability statement** Data are available upon reasonable request. Owing to the potentially sensitive nature of our research on conflict of interest, and the legal or professional ramifications on doctors for contravening codes of ethical practice, data have been anonymised. This is in line with our commitments to both AKU's and LSHTM's ethics committees. Therefore, the qualitative data generated and analysed during the current study are not publicly available but are available from the corresponding author on a reasonable request.

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