Medical Product Quality Report – COVID-19 Issues

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MORU Tropical Health Network

UNIVERSITY OF OXFORD

IDDO INFECTIOUS DISEASES DATA OBSERVATORY

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Contents

1 Summary of findings

COVID-19 has affected almost every nation state. A parallel pandemic of substandard and falsified (SF) COVID-19 medicinal product is spreading across the globe for diagnostic tests, medicines, vaccines, ventilators and personal protective equipment including masks & respirators, sanitizers, gloves, gowns, etc. From January to July 2020[1], articles reported on SF problems in at least 50 different countries, in the English language lay press alone. Patients health is at risk in high, low and middle income countries due to problems at all levels of the supply chain.

From March onwards there is a clear rise in articles and alerts in the lay press on SF medical products linked to COVID-19. The month of July has had the lowest number of alerts since February. Compared to the previous months there is a substantial decrease in articles reporting on problems with COVID-19 diagnostics. Throughout the last months, the majority of the articles report on problems with personal protective equipment, with a peak in reports in June. In June attention was drawn to multiple problems with SF masks and respirators. Whereas in July the focus shifted more towards SF hand sanitizers containing methanol, especially in the United States.

In June the use of remdesivir was been discussed extensively in the media. The first SF report was found in July, genuine remdesivir was detected on the Indian black market linked to price gouging and problems with the follow up of good distribution practices. Mid-June evidence was been published on the beneficial effects of dexamethasone in critically ill COVID-19 patients. In July falsified dexamethasone was reported. Although efficacy is not proven yet in clinical trials, the first problems with SF immunomodulators were recorded in July. Careful monitoring and data sharing are needed – as more medicines and, hopefully vaccines, are shown to have efficacy and are approved for use we expect an increase in SF issues.

2 Introduction

During the COVID-19 pandemic, the demand for COVID-19 related medical supplies has inevitably ballooned with an increased demand for personal protective equipment (PPE), diagnostics and preventive & curative pharmaceuticals. The high demand and related shortages of genuine products contributes to an increased global risk of substandard and falsified (SF) medical products, for COVID-19 and for many other essential medicines. The media have been reporting diverse examples of SF products flooding the market.

This report aims to collate information and reports in the public domain on the quality of medicinal products that are currently in use, or that are being trialed for COVID-19's prevention or treatment. We also include reports on key subjects such as access, affordability or off label use for COVID-19 if

[1] This second issue of the monthly report 'Medical Product Quality Report – COVID-19 Issues' covers information published during the month of July. The first issue covered publications from January 1st to June 30th 2020 and is available on the IDDO website:
Medicine Quality Research Group, University of Oxford. **Medical Product Quality Report -COVID-19 Issues.** Issue 1, January to June 2020, viewed 13 August 2020, https://www.iddo.org/sites/default/files/publication/2020-08/Medical%20Product%20Quality%20Report_Covid-19%20Issues_Issue%201%20Jan-June%202020_Main%20text%20plus%20annexes_12aug2020.pdf

they mention concern of the quality of the products. We do not aim to include discussion of the multiple fraudulent claims and quackery.

We use the terminology for different types of poor quality medical products as defined by the World Health Organisation (WHO 2017)[2]:

> **Substandard medical products***:*
> Also called "out of specification", these are authorized medical products that fail to meet either their quality standards or their specifications, or both.
> **Unregistered/unlicensed medical products**:
> Medical products that have not undergone evaluation and/or approval by the national or regional regulatory authority for the market in which they are marketed/distributed or used, subject to permitted conditions under national or regional regulation and legislation.
> **Falsified medical products***:*
> Medical products that deliberately/fraudulently misrepresent their identity, composition or source.

We emphasise the difference between the use of the terms 'falsified' and 'counterfeit' medical products. 'Falsified' is a broad term including all the various types of deliberate misrepresentation of a medical product from a public health perspective. The term 'counterfeit' is specifically linked to intellectual property rights, 'trademark counterfeit goods'[3] and 'pirated copyright goods'[4] as used in the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement.
The reports presented were mostly extracted from the Medicines Quality Monitoring Globe (MQM Globe)[5], a system that scrapes online newspapers (referenced in Google News) for early warnings of substandard and falsified medical products. In addition, alerts and reports by national and international organisations are included when captured by the members of the team or shared by colleagues. This report also includes scientific literature and policy documents related to COVID-19 medical products quality identified by manual searches in Pubmed and Google Scholar. These will be displayed on the Medicine Quality COVID-19 Surveyor to be released in the coming months. We also include preprint of articles. Please note that preprints should be viewed with additional caution as

[2] Source: Appendix 3 to Annex, World Health Assembly document A70/23, 2017, viewed 14 August 2020, https://www.who.int/medicines/regulation/ssffc/A70_23-en1.pdf?ua=1
[3] 'Trademark counterfeit goods': any goods, including packaging, bearing without authorization a trademark which is identical to the trademark validly registered in respect of such goods, or which cannot be distinguished in its essential aspects from such a trademark, and which thereby infringes the rights of the owner of the trademark in question under the law of the country of importation.
Source: World Trade Organization, viewed 14 August 2020, https://www.wto.org/english/docs_e/legal_e/27-trips_05_e.htm#fnt-14.
[4] 'Pirated copyright goods': any goods that are copies made without the consent of the right holder or person duly authorized by the right holder in the country of production, and which are made directly or indirectly from an article where the making of that copy would have constituted an infringement of a copyright or a related right under the law of the country of importation.
Source: World Trade Organization, viewed 14 August 2020, https://www.wto.org/english/docs_e/legal_e/27-trips_05_e.htm#fnt-14.
[5] Infectious Disease and Data Observatory. **Medicine Quality Monitoring Globe**, viewed 14 August 2020, https://www.iddo.org/mqmglobe/

they have not been peer-reviewed. They should not be relied on to guide clinical practice or health-related behaviour and should not be reported in news media as established information.

Please note the caveats for the lay literature (MQM Globe disclaimer and caveats[6]); we include abstracts and extracts from articles that are subject to a take down policy. If we are contacted by a potential rights-holder who objects to the presence of material, we will remove the material in question from the report and Globe until we have been able to assess the case. Where material is removed for valid reasons of copyright, its removal will be considered as lasting until copyright in the material expires, or until the rights-holder agrees that the material can be reinstated.

This second issue of the monthly report **Medical Product Quality Report – COVID-19 Issues** covers information published during the month of July. The first issue covered publications from January 1st to June 30th 2020 and is available on the IDDO website[7]. We are developing a system for scraping regulatory authority and international organisation websites for alerts that we will also include. Any remarks or additions to content are greatly appreciated (please write to medicinequality@iddo.org).

3 Scientific literature

3.1 General

Freckelton QCI. **COVID-19: Fear, quackery, false representations and the law.** *Int J Law Psychiatry*. Online ahead of print; 101611. doi: 10.1016/j.ijlp.2020.101611 Epub 2020 July 10. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7351412/pdf/main.pdf

> Abstract. *"Fear, anxiety and even paranoia can proliferate during a pandemic. Such conditions, even when subclinical, tend to be a product of personal and predispositional factors, as well as shared cultural influences, including religious, literary, film, and gaming, all of which can lead to emotional and less than rational responses. They can render people vulnerable to engage in implausible conspiracy theories about the causes of illness and governmental responses to it. They can also lead people to give credence to simplistic and unscientific misrepresentations about medications and devices which are claimed to prevent, treat or cure disease. In turn such vulnerability creates predatory opportunities for the unscrupulous. This article notes the eruption of quackery during the 1889-1892 Russian Flu and the 1918-1920 Spanish Flu and the emergence during 2020 of spurious claims during the COVID-19 pandemic. It identifies consumer protection strategies and interventions formulated during the 2020 pandemic. Using examples from the United States, Japan, Australia and the United Kingdom, it argues that during a pandemic there is a need for three responses by government to the risks posed by conspiracy theories and false representations: calm, scientifically-based messaging from public health authorities; cease and desist warnings directed toward those making extravagant or inappropriate claims; and the taking of assertive and well publicised legal action against individuals and entities that make false representations during a pandemic in order to protect consumers rendered vulnerable by their emotional responses to the phenomenology of the pandemic."*

[6] Infectious Disease and Data Observatory. **Medicine Quality Monitoring Globe disclaimer and caveats**, viewed 17 August 2020, https://www.iddo.org/medicine-quality-monitoring-globe-disclaimer-and-caveats

[7] Medicine Quality Research Group, University of Oxford. **Medical Product Quality Report -COVID-19 Issues.** Issue 1, January to June 2020, viewed 13 August 2020, https://www.iddo.org/sites/default/files/publication/2020-08/Medical%20Product%20Quality%20Report_Covid-19%20Issues_Issue%201%20Jan-June%202020_Main%20text%20plus%20annexes_12aug2020.pdf

Godman B. **Combating COVID-19: Lessons learnt particularly among developing countries and the implications.** *Bangl J Med Sc [Special issue on Covid19]*. 2020 July; S103-S108 doi:10.3329/bjms.v19i0.48413.
https://www.researchgate.net/publication/343228023_Combating_COVID-19_Lessons_learnt_particularly_among_developing_countries_and_the_implications#fullTextFileContent

> Extract from the text. "*Encouragingly there has been increase in the utilisation of personal protective equipment (PPE) across countries to help prevent the spread of COVID-19; however this has resulted in shortages and associated price rises. Shortages are though being addressed through increasing local production in a number of countries, and this is likely to remain. However care is needed to address concerns with sub-standard or falsified medicines, which are likely to increase where there are medicine shortages. Initiatives such as the Lomé initiative, which places falsified and substandard medicines on the highest political agenda, alongside current measures to strengthen the legal response to falsified medicines, are considerations for the future in pertinent developing countries."*

Rogerson SJ, Beeson JG, Laman M, Poespoprodjo JR, William T, Simpson JA, Price RN. **Identifying and combating the impacts of COVID-19 on malaria.** *BMC Med*. 2020; 18:239. doi: 10.1186/s12916-020-01710-x. Epub 2020 Jul 30.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7391033/pdf/12916_2020_Article_1710.pdf

> Abstract. *"Background: The COVID-19 pandemic has resulted in millions of infections, hundreds of thousands of deaths and major societal disruption due to lockdowns and other restrictions introduced to limit disease spread. Relatively little attention has been paid to understanding how the pandemic has affected treatment, prevention and control of malaria, which is a major cause of death and disease and predominantly affects people in less well-resourced settings. Main body: Recent successes in malaria control and elimination have reduced the global malaria burden, but these gains are fragile and progress has stalled in the past 5 years. Withdrawing successful interventions often results in rapid malaria resurgence, primarily threatening vulnerable young children and pregnant women. Malaria programmes are being affected in many ways by COVID-19. For prevention of malaria, insecticide-treated nets need regular renewal, but distribution campaigns have been delayed or cancelled. For detection and treatment of malaria, individuals may stop attending health facilities, out of fear of exposure to COVID-19, or because they cannot afford transport, and health care workers require additional resources to protect themselves from COVID-19. Supplies of diagnostics and drugs are being interrupted, which is compounded by production of substandard and falsified medicines and diagnostics. These disruptions are predicted to double the number of young African children dying of malaria in the coming year and may impact efforts to control the spread of drug resistance. Using examples from successful malaria control and elimination campaigns, we propose strategies to re-establish malaria control activities and maintain elimination efforts in the context of the COVID-19 pandemic, which is likely to be a long-term challenge. All sectors of society, including governments, donors, private sector and civil society organisations, have crucial roles to play to prevent malaria resurgence. Sparse resources must be allocated efficiently to ensure integrated health care systems that can sustain control activities against COVID-19 as well as malaria and other priority infectious diseases. Conclusion: As we deal with the COVID-19 pandemic, it is crucial that other major killers such as malaria are not ignored. History tells us that if we do, the consequences will be dire, particularly in vulnerable populations."*

Gereffi G. **What does the COVID-19 pandemic teach us about global value chains? The case of medical supplies.** *J Int Bus Policy*. Online ahead of print; 1-15. doi: 10.1057/s42214-020-00062-w. Epub 2020 Jul 15.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7360894/pdf/42214_2020_Article_62.pdf

Extract from the paper. *"Regulatory policies are crucial for all healthcare supply chains, both in the home market (such as the legal liability concern over N95 masks) and also in the transparency of international supply chains, where informal subcontracting has often compromised quality and lowered confidence in these arrangements. However, GVC studies highlight that regulations for the same products can vary in their stringency or levels of enforcement in large developing economies such as China, which could promote or hinder upgrading among GVC suppliers (Kaplinsky, Terheggen & Tijaja, 2010)."*

Monteiro MA, Novotný TS, Condé de Lima P, Ochs SM. **Sanitary Surveillance of Medicines and Counterfeit in Combating Covid19: Chloroquine and other products.** *BJRH*. 2020 July 16; 3(4): 8357. doi:10.34119/bjhrv3n4-090.
https://www.brazilianjournals.com/index.php/BJHR/article/view/13308/11187

Abstract. *"In view of the pandemic decreed by the World Health Organization due to the worldwide advance of Covid-19 and its rapid spread and severity, chloroquine has emerged as a possible protocol for treating the disease, especially in patients with severe and hospitalized cases. Chloroquine is a drug used to treat malaria, rheumatoid arthritis and lupus, but it also has antiviral and anti-inflammatory activities, demonstrating its potent efficacy in the treatment of patients with Covid-19 pneumonia. The safety, quality and efficacy of medicines is a concern of sanitary surveillance, as the presence of counterfeit and low quality medicines is an important public health issue that poses a considerable risk to the lives of millions of people. Several studies indicate low quality or counterfeit products, being antimalarials and antibiotics the most reported. This problem can prolong illness and inconvenience, increase suffering and even cause the death of patients. Chloroquine is one of the drugs with several low-quality and counterfeit findings, therefore, the constant inspection and regulation of this drug is a major concern, since the increase in its demand to fight the virus can encourage the production of products that do not present the expected safety, quality and effectiveness. In yet another challenging moment for Public Health, it is essential to highlight the importance of the sanitary surveillance of products, in order to guarantee an effective treatment for the most serious cases of Covid-19 and to confront this disease."*

McKee M. **England's PPE procurement failures must never happen again.** *BMJ*. 2020 July 17; 370. doi: 10.1136/bmj.m2858. https://www.bmj.com/content/370/bmj.m2858

Extract from the text. *"Numerous accounts of procurement failures have emerged across Europe during the current pandemic. Health authorities entered into contracts with companies that promised much but failed to deliver, and what they did supply was often substandard. In some cases certification documents were issued without checks or were forged. A few seem to have involved corruption or organised crime. Yet often it was just that mistakes were made. Hard pressed procurement staff failed to do the most basic due diligence procedures, such as checking whether the company had filed accounts, had assets, or had any experience in what it claimed it could do."*

Perrin C, Cloez S, Dujardin C, Ravinetto R. **Europe should lead in coordinated procurement of quality-assured medicines for programmes in low-income and middle-income countries**. *BMJ Glob Health*. 2020; 5(7): e003283. doi: 10.1136/bmjgh-2020-003283. Epub 2020 Jul 26. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7383953/pdf/bmjgh-2020-003283.pdf

Summary box. *"Thoughtful procurement policies in humanitarian and development medical programmes can mitigate the risk of purchasing poor-quality medicines, allowing to address fundamental moral obligation to equity, transparency and accountability. European donors are aware of the quality problems in the global pharmaceutical market, and some are already translating awareness into explicit procurement and quality assurance policies. However, a joint position and coordinated action is lacking. European donors should share existing knowledge and tools, seek the input of recipient countries, and develop a joint position on how the donor community can help to*

ensure access to affordable and quality-assured health products—also during public health emergencies such as the COVID-19 pandemic. Applying stringent and harmonised quality assurance requirements, European donors and their implementing organisations can help shaping the global pharmaceutical market towards affordable, quality assured products."

Publications prior to July 2020

Additions to Medical Product Quality report: Covid-19 Issues. Issue 1. Jan-June 2020

- Goodman, JL, Borio L. **Finding Effective Treatments for COVID-19 Scientific Integrity and Public Confidence in a Time of Crisis.** *JAMA.* 2020 April 16; 323(19):1899-1900. doi:10.1001/jama.2020.6434.https://jamanetwork.com/journals/jama/article-abstract/2764823

  Extract from the text. *"In this context, the recent issuance of the chloroquine/hydroxychloroquine EUA [Emergency Use Authorization] in the midst of political pressure and with scant and conflicting supporting evidence, should be of serious concern. Although everyone hopes these drugs will be found to work, the weakness of currently existing efficacy data and safety concerns are significant. Furthermore, growing enthusiasm about the drugs has resulted in unintended consequences, including anecdotal reports of fatal ingestions as well as hoarding that puts patients who need the drugs for proven indications at risk. Resulting shortages also risk promoting production and use of substandard or counterfeit substitutes."*

- Erku DA, Belachew SA, Abrha S, Sinnollareddy M, Thomas J, Steadman KJ, Tesfaye WH. **When fear and misinformation go viral: Pharmacists' role in deterring medication misinformation during the 'infodemic' surrounding COVID-19.** *Res Social Adm Pharm.* Online ahead of print. doi: 10.1016/j.sapharm.2020.04.032. Epub 2020 May 1. https://www.sciencedirect.com/science/article/pii/S1551741120304551

  Abstract. *"The world has faced an unprecedented challenge when coronavirus (COVID-19) emerged as a pandemic. Millions of people have contracted the virus and a significant number of them lost their lives, resulting in a tremendous social and economic shock across the globe. Amid the growing burden of the pandemic, there are parallel emergencies that need to be simultaneously tackled: the proliferation of fake medicines, fake news and medication misinformation surrounding COVID-19. Pharmacists are key health professionals with the required skills and training to contribute to the fight against these emergencies. Primarily, they can be a relevant source of accurate and reliable information to the public or other fellow health professionals thereby reducing the spread of COVID-19 medication misinformation. This can be achieved by providing accurate and reliable information based on recommendations given by relevant health authorities and professional associations to make sure the community understand the importance of the message and thus minimise the detrimental consequences of the pandemic. This commentary aims to summarise the existing literature in relation to the promising treatments currently under trial, the perils of falsified medications and medicine-related information and the role of pharmacists in taking a leading role in combating these parallel global emergencies."*

- Rosenthal PJ, Breman JG, Djimde AA, John CC, Kamya MR, Leke RGF, Moeti MR, Nkengasong J, Bausch DG. **COVID-19: Shining the Light on Africa.** *Am J Trop Med Hyg*. 2020 Jun; 102(6):1145-1148. doi: 10.4269/ajtmh.20-0380. Epub 2020 May 5. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7253089/pdf/tpmd200380.pdf

  An editorial on how Africa has coped with epidemics in the past and now specifically with the COVID-19 outbreak. It is summing up possible response measures that Africa and global partners can undertake in the light of COVID-19. One of the areas of action are 'therapeutics and vaccines'. The authors are warning for the use of chloroquine and hydroxychloroquine for COVID-19 treatment with the risk of shortages of the drug for the recognised indications and the concurrent risk of falsified and substandard medicines.

❖ Amimo F, Lambert B, Magit A. **What does the COVID-19 pandemic mean for HIV, tuberculosis, and malaria control?** *Trop Med Health*. 2020; 48: 32. 2020; doi: 10.1186/s41182-020-00219-6. Epub 2020 May 13.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7218555/pdf/41182_2020_Article_219.pdf

Abstract. *"Despite its current relatively low global share of cases and deaths in Africa compared to other regions, coronavirus disease 2019 (COVID-19) has the potential to trigger other larger crises in the region. This is due to the vulnerability of health and economic systems, coupled with the high burden of human immunodeficiency virus (HIV), tuberculosis (TB), and malaria. Here we examine the potential implications of COVID-19 on the control of these major epidemic diseases in Africa. We use current evidence on disease burden of HIV, TB, and malaria, and epidemic dynamics of COVID-19 in Africa, retrieved from the literature. Our analysis shows that the current measures to control COVID-19 neglect important and complex context-specific epidemiological, social, and economic realities in Africa. There is a similarity of clinical features of TB and malaria, with those used to track COVID-19 cases. This coupled with institutional mistrust and misinformation might result in many patients with clinical features similar to those of COVID-19 being hesitant to voluntarily seek care in a formal health facility. Furthermore, most people in productive age in Africa work in the informal sector, and most of those in the formal sector are underemployed. With the current measures to control COVID-19, these populations might face unprecedented difficulties to access essential services, mainly due to reduced ability of patients to support direct and indirect medical costs, and unavailability of transportation means to reach health facilities. Therefore, if not accompanied with appropriate economic and epidemiological considerations, we anticipate that these measures might result in unprecedented difficulties among vulnerable segments of society to access essential services, including antiretroviral and prophylactic drugs among people living with HIV and Acquired Immune Deficiency Syndrome, anti-tuberculosis drugs, and curative and preventive treatments for malaria among pregnant women and children. This might increase the propensity of patients taking substandard doses and/or medicines, which has the potential to compromise drug efficacy, and worsen health inequalities in the region. COVID-19 responses at country level should include measures to protect vulnerable and under-served segments of society."*

❖ Chan AH, Rutter V, Ashiru-Oredope D, Tuck C, Barbar ZUD. **Together we unite: the role of the Commonwealth in achieving universal health coverage through pharmaceutical care amidst the COVID-19 pandemic.** *J Pharm Policy Pract.* 2020; 13:13. doi: 10.1186/s40545-020-00214-6. Epub 2020 May 13.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7218554/pdf/40545_2020_Article_214.pdf

Abstract. "*The world currently faces unprecedented health challenges as COVID-19 poses a huge threat to health systems, economies and societies as we know it. The events of the current COVID-19 pandemic have further emphasised existing issues within our health systems. There is no better time than now to come together in global solidarity to tackle these evolving threats of COVID-19 pandemic. The Commonwealth is an ideally placed network to tackle these global health challenges, with its wide-reaching networks of governmental, non-governmental and civil society organisations across all continents. Although the biennial Commonwealth Heads of Government Meeting (CHOGM) originally scheduled to take place in Kigali in Rwanda 22–27 June 2020 has been postponed in view of COVID-19, Commonwealth country discussions are continuing, centred on the CHOGM key theme of 'Delivering a Common Future: Connecting, Innovating, Transforming', and five subthemes of Information and Communications Technology (ICT) and Innovation; Trade; Environment; Governance and the Rule of Law; and Youth. The planned CHOGM and Commonwealth itself provides all members a timely platform to consider innovative ways to connect, innovate and transform healthcare to meet the needs of their populations. This commentary considers these five CHOGM subthemes and how member nations can be supported to achieve universal health coverage through optimising medicines use and outcomes, in the midst of a global pandemic in line with the global health agenda."*

❖ Berardi A, Perinelli DR, Merchant HA, Bisharat L, Basheti IA, Bonacucina G, Cespi M, Palmieri GF. **Hand sanitisers amid CoViD-19: A critical review of alcohol-based products on the market and**

formulation approaches to respond to increasing demand. *Int J Pharm.* 2020 Jun 30; 584: 119431. doi: 10.1016/j.ijpharm.2020.119431. Epub 2020 May 16. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7229736/pdf/main.pdf

Abstract. "*The world is facing a medical crisis amid the CoViD-19 pandemic and the role of adequate hygiene and hand sanitisers is inevitable in controlling the spread of infection in public places and healthcare institutions. There has been a great surge in demand for hand sanitisation products leading to shortages in their supply. A consequent increase of substandard products in the market has raised safety concerns. This article, therefore, presents a critical review of hand sanitation approaches and products available on the market in light of the scientific evidence available to date. This review also provides a range of hand sanitisation product formulations, and manufacturing instructions to allow for extemporaneous preparations at the community and hospital pharmacies during this urgent crisis. In addition, this emergent situation is expected to continue, hence hand sanitisers will be in demand for an extended time, and the availability and purchase of substandard products on the market create an ongoing safety concern. Therefore, this article shall also provide various commercial organisations, interested in stepping forward the production and marketing of hand sanitisers, with a guide on the development of products of standardised ingredients and formulations.*"

- Adebisi YA, Jumoke AA, Carolyn OO. **Coronavirus disease-19 and access to medicines in Africa.** *Int J Health Allied Sci [serial online]*. 2020 June 4; 9(5):120-121. Available from: http://www.ijhas.in/text.asp?2020/9/5/120/285970

  Extract from the text. "*It is not in the interest of the continent's drug security to depend largely on imported drugs and equipment to meet the healthcare needs of the population. There is a need to scale up drug manufacturing in Africa as this will not just aid in meeting the healthcare needs of the populace but will aid in combating the preponderance of falsified, substandard and counterfeit pharmaceutical products, which pose a threat to public health.*

- Lumpkin MM, Lim JCW. **Pandemic Best Regulatory Practices: An Urgent Need in the COVID-19 Pandemic.** *Clin Pharmacol Ther.* Online ahead of print; 10.1002/cpt.1932. doi: 10.1002/cpt.1932. Epub 2020 Jun 4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7300901/pdf/CPT-9999-na.pdf

  Abstract. *"As large numbers of candidate drugs and vaccines for potential use in the Covid-19 pandemic are investigated, medicines regulators globally must now make urgent, informed, contextually risk based decisions regarding clinical trials and marketing authorizations. They must do this with the flexibility demanded by the pandemic while maintaining their core risk assessment and public safety functions. We lay out the critical role of regulators in the current crisis and offer eight "pandemic best regulatory practices." These should support both the regulatory public heath imperative and assure timely patient access to effective, safe, quality products worldwide during this emergency – thus contributing to ending this pandemic as quickly, effectively, and safely as possible."*

- Akande-Sholabi W, Adebisis YA. **The impact of COVID-19 pandemic on medicine security in Africa: Nigeria as a case study.** *Pan African Medical Journal.* 2020 Jun 10; 35(2):73. doi: 10.11604/pamj.supp.2020.35.2.23671. Epub 2020 May 22. https://www.panafrican-med-journal.com/content/series/35/2/73/full/

  Conclusion. *"The net impact of COVID-19 pandemic may occur soon with worrisome outcome on the health of Nigerians. In addition, the threat to medicine insecurity due to the pandemic could result into increase in circulation of fake and counterfeit medicines putting lives of millions at danger. This is a further concern in that the country has been struggling over the years to fight fake, counterfeited, and sub-standard medicines in its supply chain. It is also very important for the country to fund herbal medicine research and increase its commitment towards advancing it. Extensive research should be implored to fully utilize the potential of herbal medicine because Nigeria is blessed with thousands of*

plants with potential health benefits. Furthermore, the need to encourage local pharmaceutical companies and herbal medicine research is essential towards improving public health."

- Ojong N. **The COVID-19 Pandemic and the Pathology of the Economic and Political Architecture in Cameroon.** *Healthcare.* 2020 June 17; 8(2):176. doi: 10.3390/healthcare8020176. https://www.mdpi.com/2227-9032/8/2/176

  Abstract. *"This article examines the factors restricting an effective response to the COVID-19 pandemic in Cameroon. It argues that structural adjustment policies in the 1980s and 1990s as well as corruption and limited investment in recent times have severely weakened the country's health system. This article also emphasises the interconnection between poverty, slums, and COVID-19. This interconnection brings to the fore inequality in Cameroon. Arguably, this inequality could facilitate the spread of COVID-19 in the country. This article draws attention to the political forces shaping the response to the pandemic and contends that in some regions in the country, the lack of an effective response to the pandemic may not necessarily be due to a lack of resources. In so doing, it critiques the COVID-19 orthodoxy that focuses exclusively on the pathology of the disease and advocates "technical" solutions to the pandemic, while ignoring the political and socio-economic forces that shape the fight against the pandemic. At times, medical supplies and other forms of assistance may be available, but structural violence impairs access to these resources. Politics must be brought into the COVID-19 discourse, as it shapes the response to the pandemic."*

- Caldera-Villalobos C, Garza-Veloz I, Martínez-Avila N, Delgado-Enciso I, Ortiz-Castro Y, Cabral-Pacheco GA, Martinez-Fierro ML. **The Coronavirus Disease (COVID-19) Challenge in Mexico: A Critical and Forced Reflection as Individuals and Society.** *Front Public Health*. 2020; 8:337. doi: 10.3389/fpubh.2020.00337. Epub 2020 Jun 26. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7332544/pdf/fpubh-08-00337.pdf

  Extract from the paper. *"Another very important aspect was the use of poor quality PPE, which has been a constant throughout the evolution of the pandemic and which has reached such magnitudes that health personnel have seen the need to actively stop and mobilize in protests."*

- Lebed S, Nemchenko A, Zdoryk A. **Estimation of the possibility of expanding the instrument base for the rapid detection of falsified medicinal products in the Rivne region.** *ScienceRise:Pharmaceutical Science.* 2020 June 30; 0 (3(25)): 39-43. doi: 10.15587/2519-4852.2020.209107. https://journals.indexcopernicus.com/search/article?articleId=2585347

  Abstract. *"The aim of the research was assessment of ways to expand the instrument base of photometric equipment for quality control of medicines, substantiation of prospects for their implementation and application in the activities of the territorial service for medicines and drug control in Rivne region.*
  Materials and methods. Literature data, scientific publications on the application of photometric methods in drug quality control and own research on drug quality control were used. The methods of system analysis, bibliosemantic, data generalization was used in the work, the method of absorption spectrophotometry in the infrared region is used in the experimental research.
  Results. It is analyzed the effectiveness of IR spectroscopy for quality control of drugs and detection of their counterfeits in the framework of improving modern approaches to counteracting and combating the turnover of drugs in Ukraine. The prospect of using portable Raman spectrometers for drug quality control is established, based on their advantages over IR spectrophotometry. It was analyzed a list of drugs containing (azithromycin, erythromycin, ibuprofen, paracetamol, clarithromycin, cefuroxime sodium), including antipyretics and antibiotics that can be used to treat complications of COVID-19, in the field of involvement of the instrument base of the National University of Water Management and Nature Management and Rivne State University for the Humanities of Rivne.
  Novelty of the obtained results. For the first time, the paper suggests the involvement of the instrument base of higher education institutions for routine quality control of drugs and detection of their counterfeits by territorial laboratories for quality control of medicines on the example of Rivne

region. The necessity of introduction and equipping of territorial bodies of the state quality control of medicines with portable devices of Raman spectrometry for carrying out express, non-destructive quality control of medicines is substantiated.
Conclusions. The method of Raman spectroscopy is relevant for the implementation of the State Service for Medicines and Drug Control. The introduction of this method and equipment will increase the efficiency of inspections, as well as significantly reduce the time of analysis. According to the results of experimental research on the basis of the National University of Water Management of Rivne and Rivne State University for the Humanities, it is expedient and possible to involve the equipment of regional educational institutions and laboratories to detect counterfeits and prevent their use by the health care system"

3.2 Seizures/Surveys/Case Reports/Reviews

[MedRxiv preprint] Plana D, Tian E, Cramer AK, Yang H, Carmack MM, Sinha MS, Bourgeois FT, Yu SH, Masse P, Boyer J, Kim M, Mo J, LeBoeuf NR, Li J, Sorger PK. **Assessing the quality of nontraditional N95 filtering face-piece respirators available during the COVID-19 pandemic.** MedRxiv preprint. Jul 2020. doi: 10.1101/2020.07.25.20161968.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7386520/pdf/nihpp-2020.07.25.20161968.pdf

Abstract. *"Background: During the current COVID-19 pandemic, supply chains for Personal Protective Equipment (PPE) have been severely disrupted and many products, particularly surgical N95 filtering facepiece respirators (FFRs; "masks") are in short supply. As a consequence, an Emergency Use Authorization (EUA) from the FDA has allowed importation of N95-type masks manufactured to international standards; these include KN95 masks from China and FFP2 masks from the European Union.*
Methods: We conducted a survey of mask in the inventory of major academic medical centers in Boston, MA to determine provenance and manufacturer. We then assembled a simple apparatus for performing a necessary (but not sufficient) test of filtration performance and tested masks from the inventory; an accompanying website shows how to build and use the testing apparatus.
Results: Our survey showed that, seven months after the start of the COVID-19 pandemic, over 100 different makes and models of N95-type masks are in the inventory of local hospitals as opposed to 2–5 models under normal circumstances. A substantial number of unfamiliar masks are from unknown manufacturers. Many did not perform to accepted standards and are likely to be counterfeit. Due to the absence of publicly available information on mask suppliers in the FDA EUA and confusing or inconsistent labeling of KN95 masks, it is difficult to distinguish legitimate and counterfeit products.
Conclusions: Many of the FFR masks available for procurement during the COVID-19 pandemic do not provide levels of fit and filtration similar to those of N95 masks and are not acceptable for use in healthcare settings. Based on these results, and in consultation with occupational health officers, we make six recommendations for end users to assist in acquiring legitimate products. In particular, institutions should always assess masks from non-traditional supply chains by checking their markings and manufacturer information against data provided by NIOSH and the latest FDA EUA Appendix A. In the absence of verifiable information on the legitimacy of mask source, institutions should consider measuring mask fit and filtration directly. We also make suggestions for U.S and Chinese regulatory agencies with regard to labeling and public disclosure aimed at increase pandemic resilience."

4 International organisations

United Nations Office on Drugs and Crime. **COVID-19-related Trafficking of Medical Products as a Threat to Public Health.** *Research Brief.* 2020 July 6. Available from: https://www.unodc.org/documents/data-and-analysis/covid/COVID-19_research_brief_trafficking_medical_products.pdf

> Executive summary. *"Restrictions on movement imposed by governments across the world due to the COVID-19 pandemic have had an impact on the trafficking of substandard and falsified medical products. Interpol and the World Customs Organization (WCO) reported that seizures of substandard and falsified medical products, including personal protective equipment (PPE), increased for the first time in March 2020. The emergence of trafficking in PPE signals a significant shift in organized criminal group behaviour that is directly attributable to the COVID-19 pandemic, which has brought huge demand for medical products such as PPE over a relatively short period of time. It is foreseeable that, with the evolution of COVID-19 and developments in medicinal treatments and/or the repurposing of existing medicines, criminal behaviour will shift from trafficking in PPE to the development and delivery of a COVID-19 vaccine. Furthermore, cyberattacks on critical infrastructure involved in addressing the pandemic are likely to continue in the form of online scams aimed at health procurement authorities.*

United Nations Office on Drugs and Crime. **The impact of COVID-19 on organized crime.** *Research Brief.* 2020 July 13. Available from: https://www.unodc.org/documents/data-and-analysis/covid/RB_COVID_organized_crime_july13_web.pdf

> Extract of the executive summary. *"High demand coupled with low supply in key sectors opens way for OCGs The pandemic has brought dramatic spikes in demand to some sectors, for example medical devices, pharmaceutical products, e-commerce, food retail, cleaning, and funeral services. The demand for sanitary masks, breathing devices, and medicines has also risen notably. As governments seek to shore up their defences against the pandemic, procurement procedures in some countries have been relaxed. There is already evidence from countries around the world that organized crime has moved into these sectors – especially where traditional means of making illicit profits, such as illicit drugs and firearms trafficking and smuggling of migrants are being tightly constricted by restrictions on movement. For the impact of covid-19 on organized crime 2 example, falsified medical masks have been seized in Spain and Italy, attempts to smuggle vital equipment have been stopped in Ukraine, Iran, and Azerbaijan; one Mexican cartel has been promoting the production of falsified COVID-19 medical products and forcing pharmacies to sell them."*

Interpol. **Operation in the Middle East and North Africa targets pharmaceutical crime.** *News*. 2020 July 16. Available from: https://www.interpol.int/fr/Actualites-et-evenements/Actualites/2020/Operation-in-the-Middle-East-and-North-Africa-targets-pharmaceutical-crime

> Extract from the news. *"Running from 1 February to 1 April 2020, the operation coincided with the coronavirus pandemic, and saw a trend in the trafficking of items related to COVID-19. Among the seizures were: 61,000 respiratory masks and one artificial respirator in Morocco; 63,418 face masks and 360 sanitizing products in Jordan; 85,000 medical products (facemasks, gloves, thermometers, medical glasses, etc.) in Qatar. These results confirm the trend observed under the global Operation Pangea, also run by INTERPOL, in March. The outbreak of the coronavirus disease has offered an opportunity for fast cash, as criminals take advantage of the high market demand for personal protection and hygiene products. Challenges in pandemic preparedness, ranging from weak regulatory and legal frameworks to the prevention of the manufacturing and trafficking of substandard and falsified products and cyber security shortcomings, were evident before COVID-19, but the pandemic has exacerbated them and it will be difficult to make significant improvements in the immediate short term. The report concludes that crime targeting COVID-19 medical products will become more focused*

with significantly greater risks to public health as the containment phase of the pandemic passes to the treatment and prevention stages."

Publication prior to July 2020

Addition to Medical Product Quality report: Covid-19 Issues. Issue 1. Jan-June 2020.

World Bank Group. **Streamlining Technical Measured on Medical Products to Combat COVID-19.** *Report.* 2020 May 21. Available from: http://documents1.worldbank.org/curated/en/304931590509092851/pdf/Streamlining-Technical-Measured-on-Medical-Products-to-Combat-COVID-19.pdf

Key messages. "(*)*The urgency of effective responses to the COVID-19 pandemic and the reliance of many low-income countries on imports of medical products, requires new approaches to regulation of these products. The challenge will be particularly acute for the new tests to identify infection, drugs to alleviate symptoms and machines to aid recovery as well as vaccines that are all expected to be developed in the coming months.* (*)*Increased transparency, information sharing and greater cooperation among agencies responsible for the approval and inspection of medical goods around the world can help officials in low-income countries implement their mandate more effectively while maximizing efficient access to these commodities.* (*)*Responsible agencies should focus on implementing technical regulations to protect health and safety, including interception of counterfeit and substandard products, and avoid wasting resources and creating delays by maintaining procedural practices that may be better addressed through alternative risk management strategies or seeking to regulate quality issues, which are best left to the market.* (*)*Where there is a need to rapidly approve, test and inspect new goods or varieties that have not previously been imported, such as new equipment and medicines, the adoption of mutual recognition and/or equivalence can provide effective mechanisms to avoid regulatory delays while maintaining high levels of safety."*

5 Miscellaneous

The Partnership for Safemedicines. **Statement On Trump Administration Executive Order On Drug Importation.** *News release.* 2020 July 24. https://www.safemedicines.org/2020/07/statement-on-trump-administration-executive-order-on-drug-importation.html

A statement by Shabbir Safdar, executive director of the Partnership for Safe Medicines in response to the changes to the prescription drug importation scheme in the USA. He asserts that there health risk goes together with drug importation, creating additional opportunities for malicious persons to fill the gap in supply and demand of COVID-19 treatments.

National Association of Manufacturers. **Countering Counterfeits: The Real Threat of Fake Products.** *White paper.* July 2020.
https://www.nam.org/wp-content/uploads/2020/07/CounteringCounterfeits.vF_.pdf

Conclusion. *"The current COVID-19 pandemic and the countless headlines about fake test kits, counterfeit face masks and fake drugs underscore the counterfeiting challenge. But this problem extends beyond health products. It also affects manufactured products that American households use every day, from auto parts to clothing to toys. Counterfeit versions of many products are widely available to American consumers, particularly through e-commerce platforms. These counterfeit goods pose a triple threat: harming the safety and well-being of consumers, limiting the competitiveness of manufacturers of all sizes and undermining American innovation. Manufacturers need real, actionable, innovative policy solutions that reverse the rising tide of counterfeit products. This report provides a series of clear, decisive actions that all stakeholders can take, in government and in the private sector, to stop counterfeiters in their tracks."*

6 Lay literature

6.1 Disclaimer & Notes

The information included below is based on the data used to create the Medicine Quality Monitoring Globe (MQM Globe). It contains publicly available information on the quality of medical products from non-peer-reviewed lay literature. We report the information as it is stated in the articles and can thus be biased towards the authors perspective. It does not necessarily reflect our vision or judgment on the issue. Also, this information usually will not have scientific confirmation. Therefore, the information needs to be interpreted with the greatest caution. We regard the reports as early warnings of potential problems. No or few articles from a region does not imply that the medical product quality there is good, but probably reflects a lack of accessible information. Full disclaimer and caveats can be found at MQM Globe disclaimer and caveats[8].

The Google News search tool is used to capture data from online news sources. Articles matching the search terms are loaded into a database and curated by trained analysts. Because the Globe system extracts newspaper articles from journals referenced in Google News only, reports not referenced in Google News would not be captured. Please consult the website for full methodology[9]. On the 20th of March, the search terms were adapted to capture more papers on Substandard and Falsified (SF) medical supplies for COVID-19.

The news articles discussed in the sections below are available in the Globe-reports, in this report's annexes, or on the online MQM Globe, using the report ID (six digits code). The MQM Globe-reports are generated with pre-defined search terms, which enable quick access to reports of (a) COVID diagnostics, (b) Personal protective equipment, (c) COVID trial medicines, and (d) Ventilators and Positive end-expiratory pressure (PEEP).

In this report we share articles captured by the MQM Globe that are linked to medical products that potentially are used in the context of Covid-19 or to active pharmaceutical ingredients (APIs) that are being trialed for Covid-19 treatment and/or prevention. In theory there is a distinction between (a) SF incidents that are due to or increased by the COVID-19 epidemic; and (b) incidents that would have happened in any case. It can be difficult to make the distinction between the two types of incidents and some reports cited here below are not directly linked to the treatment of COVID-19. Nevertheless we have included them as crossover risks and to see if the alerts on these medical products change over time.

For this report, we only included data that were published in English. For articles in French, Spanish, Mandarin, and Vietnamese; please consult the online MQM Globe. We will continuously work to improve the MQM Globe and add in articles in other languages to this report in time. Any remarks or additions to content are encouraged (please write to medicinequality@iddo.org)

[8] Infectious Diseases Data Observatory. **Medicine Quality Monitoring Globe disclaimer and caveats**, viewed 14 August 2020, https://www.iddo.org/medicine-quality-monitoring-globe-disclaimer-and-caveats

[9] Infectious Diseases Data Observatory. **Medicine Quality Monitoring Globe methodology**, viewed 14 August 2020, https://www.iddo.org/medicine-quality-monitoring-globe-methodology

6.2 Articles on SF medical products for COVID-19 – main characteristics

From March onwards there is a clear rise in articles and alerts in the lay press on SF medical products linked to COVID-19 (figure 1 & table 1). The month of July has had the lowest number of alerts since February. In the month of July, 42 relevant articles linked to SF COVID-19 medical products, alerted through the MQM Globe database, are reported below. Within those articles, 1 alerted on vaccines, 4 are linked to diagnostics, 9 to trial medicines, and 28 to personal protective equipment (PPE) including sanitizers (figure 2). In July the MQM Globe did not identify any report linked to ventilation equipment.

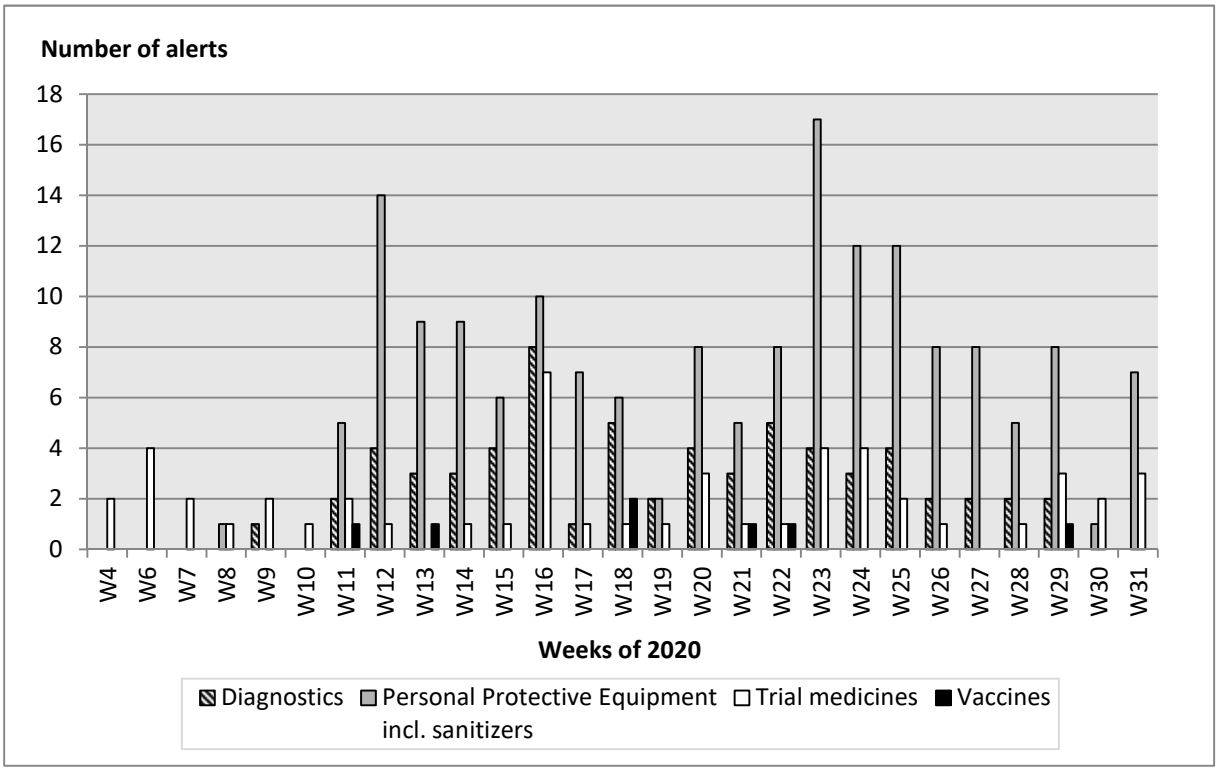

Figure 1. Number of alerts on the Medicines Quality Monitoring Globe by category and by week. Alerts are for substandard or falsified products linked to COVID-19. Week 4 started Monday 20 January 2020 and week 31 ended on Friday 31th of July 2020.

Table 1. Number of articles on the Medicines Quality Monitoring Globe linked to substandard or falsified COVID-19 supplies by month. As some articles describe more than one category of products, the sum of alerts per month as shown in figure 1 may exceed the sum of articles per month.

Month	Number of articles
January	2
February	10
March	49
April	50
May	47
June	64
July	**42**

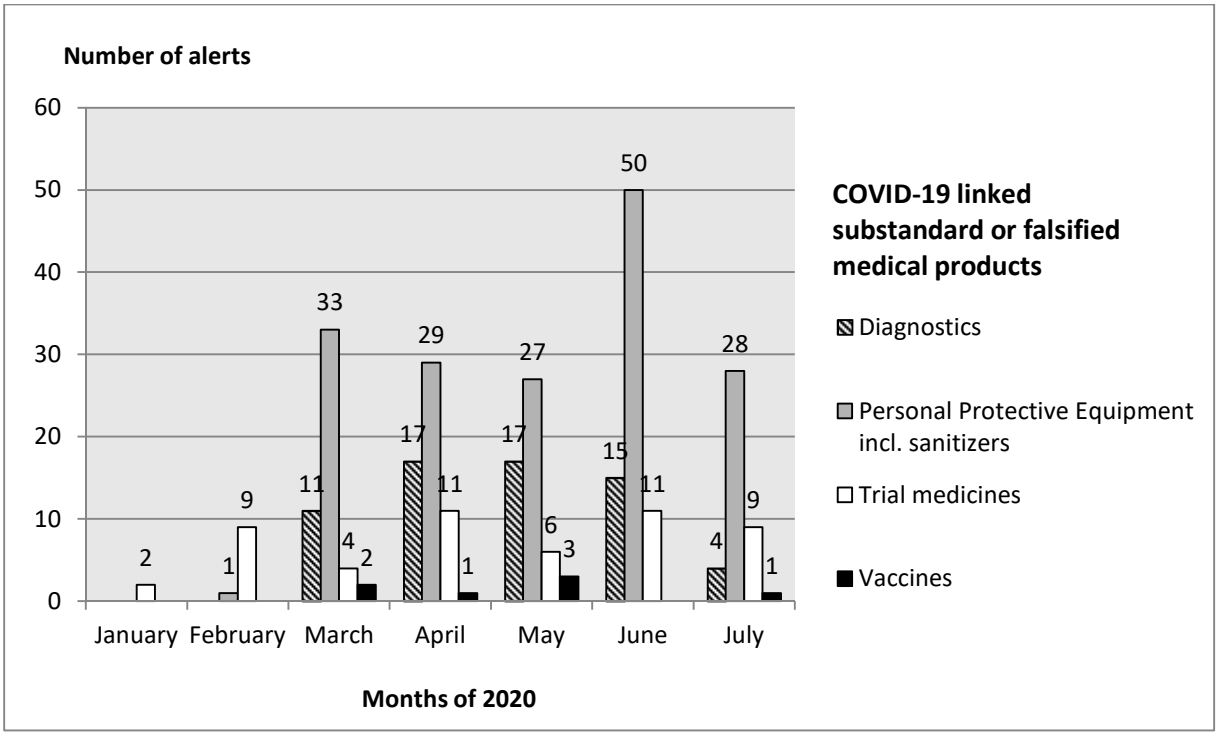

Figure 2. Number of alerts on the Medicines Quality Monitoring Globe by category of products and by month. Alerts are for substandard or falsified products linked to COVID-19. As some articles describe more than one category of products, the sum of alerts per month may exceed the sum of articles per month as shown in table 1.

One of the articles captured by the MQM Globe falls outside of the above discussed categories. The article alerts about falsified benzodiazepine tablets in Ireland (record ID: 653550[10]). The article argues that due to closure of the pubs during lockdown people turn to benzodiazepines instead of cocaine. In addition dealers may have shifted their market from cocaine to benzodiazepines because their cocaine market contracted. In July the MQM globe captured 8 articles in relation to SF benzodiazepines.

[10] Irish Mirror. **Warning over €2 fake benzo pills laced with rat poison after deaths spike during lockdown.** Pownall S, viewed 19 July 2020. https://www.irishmirror.ie/news/irish-news/crime/warning-over-2-fake-benzo-22377492

6.3 Vaccines

Many COVID-19 vaccines are being developed and are at different stages of development and trials. To date there is no approved COVID-19 vaccine on the market. In July there was one article on the MQM Globe that reported on an issue with vaccines. In the United States a man was advertising online for a pre-order of coronavirus vaccine using false and misleading statements (report ID: 646267).

6.4 COVID-19 diagnostics

The United States Food and Drug Administration (US FDA) launched an alert for a commonly used COVID-19 test with increased risk of providing false positive results (report ID: 666407). The SARS-CoV-2 reagents for the BD Max System of Becton Dickinson and Company (BD) received an Emergency Use Authorisation last April but 3% of the results turned out to be false positive. FDA and BD are working together to resolve the issue. An article reported on a study evaluating the performance of nucleic acid coronavirus test performed with Centers for Disease Control and Prevention distributed kits (report ID: 678079). The study found that the testing kits gave a 30% false-positive rate and a 20% false negative rate.

The Kenya Medical Laboratory Technicians and Technologies Board closed down the laboratory of a Nairobi hospital (report ID: 640370). The laboratory was allegedly performing Covid-19 tests but were not equipped to perform the tests. In addition invalid and expired laboratory reagents were found. In Malawi, the Ministry of Health received reports of private hospitals and pharmacies providing rapid antibody tests for the diagnosis of COVID-19 infection (report ID: 645369). A warning has been send out since this type of tests are not recommended for diagnosis of current infection with COVID-19[11].

6.5 Personal protective equipment including sanitizers

6.5.1 Sanitizers and disinfectant

Out of the 16 reports on issues with hand sanitizers, eleven were in the United States. US FDA continuously expands its list of hand sanitizers that consumers should not use. In July alone at least 100 different products (with different National Drug Code numbers), from more than 50 different manufacturers were added[12]. Many of those sanitizers are or may be contaminated with methanol (report ID: 642660, 664315). Several of them may have been produced in Mexico (report ID: 645541, 666111, 671111). But also products made in the US were recommended for recall by the US FDA, for example a hand sanitizer made by Leiper's Fork Distillery (report ID: 665628).
US FDA issued import alerts and warnings to the public[13]. They are especially concerned with the

[11] World Health Organisation. **Clinical management of COVID-19**. *Guidance.* 2020 May 27. https://www.who.int/publications/i/item/clinical-management-of-covid-19

[12] United States Food & Drug Administration. **FDA updates on hand sanitizers consumers should not use**, viewed 10 August 2020, https://www.fda.gov/drugs/drug-safety-and-availability/fda-updates-hand-sanitizers-consumers-should-not-use#products

[13] United States Food & Drug Administration. **Coronavirus (COVID-19) Update: FDA Reiterates Warning About Dangerous Alcohol-Based Hand Sanitizers Containing Methanol, Takes Additional Action to Address**

dangers of drinking methanol-contaminated hand sanitizer (report ID: 647060, 664315). Although hand sanitizers are for external use only, several articles report cases of adults and children ingesting methanol-contaminated hand sanitizers. In some cases this led to adverse events such as blindness, hospitalizations and death (report ID: 631846). In New Mexico (United States) seven people experienced "serious health events" (report ID: 638252). Since May, 4 people died and 26 were hospitalized in Arizona after ingesting hand sanitizers with methanol (report ID: 652175).

The recall of a product can be linked to the brand or just to one specific third-party manufacturer of that product. For example in July the US FDA advised consumers to stop using Greenbrier Internationals 'Assured Instant Hand Sanitizers' made in Mexico (report ID: 647620). Greenbrier International launched a recall for their products made in Mexico but did not simultaneously recall those made in China, which might have been confusing for consumers. In November 2019, the US FDA expressed its concerns on "*a pattern of drug manufacturers with serious cGMP violations*" in Greenbrier International's supply chain.

In India the Punjab's FDA warned the public against the use of 10 brands of hand sanitizers adulterated with methanol (report ID: 632796). The methanol content ranged from 7.05% to over 95%. In the United Kingdom (UK) a recall was launched for a substandard hand sanitizer sold on eBay (report ID: 649060). It contained an insufficient amount of ethanol and propan-2-ol, and contained methanol without proper labelling. Also in Australia several SF-products were found (report ID: 649060). One product contained the wrong ingredient, labelled as 80% iso-propanol but actually was mostly n-propanol. Another product contained ineffective amount of active ingredient: "AIR Clean" was labelled as containing 70% alcohol but contained only 23%. In Bangladesh, the Drug Administration reminded that permission is mandatory in order to manufacture hand sanitizers (report ID: 640085). They seized products, many of which were manufactured without any laboratory or chemist involved. Often falsified hand sanitizers contained only coloured water mixed with spirit. In Hong Kong bottles of SF disinfectant alcohol were seized (report ID: 631853).

6.5.2 Personal Protective Equipment

Seizures of SF PPE continued across the globe. For example the Mumbai police seized falsified respirators, which were stated as produced in Delhi and were sold to chemists at increased prices (report ID: 667990). In Bangladesh (report ID: 632796) and Hong Kong (report ID: 631853) seizures of SF PPE were performed. An article reported seizures in the Philippines from March, up to the end of May, of masks, gloves, goggles, and other supplies (report ID: 632428).

Furthermore, the Kenya Bureau of Standards alerted on SF medical face masks labelled as manufactured by Wandas General Supplies, Arax Mills limited and Hela Intimates EPZ (report ID: 665823). Health Canada launched a warning to consumers about falsified respirators, providing a list to facilitate identification of falsified products and emphasising the risk of using respirators which do not protect against the virus (report ID: 637043).

Concerning Products, viewed 10 August 2020, https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-reiterates-warning-about-dangerous-alcohol-based-hand-sanitizers

A company in the USA provided an analysis of falsified KN95 masks (report ID: 647786). On a sample of 11 falsified KN95 mask, 8 were stated as manufactured in China. Seventy-three percent of the falsified masks failed testing's with only 63% filtration efficiency.

An article by the Organized Crime and Corruption Reporting Project (OCCRP) reported extensively on PPE sold throughout Europe using meaningless CE marks and documents on SF masks (report ID: 631077). Misleading certification issued by authentic registered companies was allegedly used in at least 19 countries including Estonia, Lithuania, Malta, Netherlands, Portugal, and Sweden. Many of these meaningless documents were allegedly issued by the Ente Certificazione Macchine (ECM), a recognized European notified body for some medical devices and other goods but not for PPE. The ECM certificates can give the client a false sense of CE approval of the PPE, as only the small print indicates that the ECM is not involved in the certification process. Similar problems were encountered with ICR Polska documentation: the Poland based notified body issued certificates for PPE that were sold in Austria, UK and Finland. On top of this, criminals have made falsified certificates for PPE claiming to be issued by ECM and ICR Polska.

Governments facing problems with substandard or falsified masks and respirators.

In the first issue of this report we summarised reports that several governments had procuring SF masks and respirators. The Hong Kong government appears to have been affected: "Medicom" surgical masks procured in the beginning of March turned out to be falsified products (report ID: 631853). Although the masks passed local safety tests, the colour was lighter compared to the genuine product and inferior material was used for the nose bridge.
An article reported several problems with masks and respirators in the UK (report ID: 630105): passed expiry dates, surgical masks from Cardinal with risk of flaking of the foam strip and 3M respirators with signs of degradation. In March, the UK Department of Health and Social Care took the decision to no longer distribute Cardinal-respirators after problems with fit testing. But in June the same respirators were reported to still being used. The national stock pile of PPE was reported to be of substandard quality, the process to release them for use was allegedly not sufficient.

Workforce facing COVID-19

Doctors in a hospital in Bangladesh expressed safety concerns about PPE (report ID: 656006). They had doubts on the quality of the respirators and regarded them as falsified due to spelling errors on the masks, straps that came off when putting the respirator on, and an unusual physical aspect.

In the 1st issue of this report several articles warned about alleged SF PPE reaching health care workers in India. In July the media brought further insight to these events. In Telangana state many frontline workers became infected with COVID-19 (report ID: 637145). Several doctors and nurses resigned or took temporary leave from their profession fearing for their safety due to substandard PPE. In Maharashtra state a panel confirmed that the PPE delivered in March and April to several hospitals were of substandard quality (report ID: 651029). The purchase process allegedly contained many irregularities. Following the complaint of health care workers on the quality of PPE kits in Punjab, officials were removed from their posts (report ID: 633611).

The high demand for PPE during the COVID-19 pandemic has not only affected health care workers, but also affected other sectors that routinely use PPE to protect their workers. For example coal

mine workers wear protective masks to filter fine dust since prolonged exposure can lead to lung disease. However, in an Australian coal mine, SF-masks have been found: out of five samples, two had a 0% pass rate for facial seals (report ID: 668128). Unaccredited testing facilities had provided the paperwork for the falsified masks.

6.6 COVID-19 trial medicines

There is a plethora of clinical trials of repurposed and investigational antiviral and immune-based COVID-19 therapies including, but not limited to hydroxychloroquine/chloroquine, azithromycin, antivirals (such as lopinavir&ritonavir, favipiravir, umifenovir, remdesivir), immunomodulators (such as tocilizumab, sarilumab, baricitinib, rexolitinib, anakinra, interferon), vitamin C and D, corticosteroids (such as dexamethasone and methylprednisolon) and colchicine[14,15,16].

Dexamethasone and remdesivir

Until now only dexamethasone and remdesivir have shown beneficial effect in clinical trials of the treatment of COVID-19 patients. On July 10th WHO published the "*1st Invitation to Manufacturers of therapeutics against COVID-19 to submit an Expression of Interest (EOI) for Product Evaluation to the WHO Prequalification Unit*"[17]. Due to a high demand, it is to be expected that multiple substandard and falsified versions of these products will circulate soon. The MQM globe did not hold reports of falsified remdesivir. However, several media report genuine remdesivir sold at high prices on the black market in India (report ID: 667788). In a pharmacy, 86 vials of remdesivir were seized, allegedly destined to be sold illegally[18]. The quality of the product could not be assured since the vials were not stored as per instructions between 2-8°C. In Nigeria, a shipment coming from India with falsified dexamethasone was seized (report ID: 688325[19]). It is the first report on falsified dexamethasone identified by the MQM Globe since mid June, when results from the RECOVERY trial were released showing benefits for critically ill COVID-19 patients. In Ghana a seizure was performed of dexamethasone sold as herbal analgesic "dompe dompe" (report ID: 664063).

Chloroquine & Hydroxychloroquine

In Mexico Sanofi-Aventis alerted about falsified Plaquenil 200mg (report ID: 645609). The product did not contain hydroxychloroquine and the primary and secondary packaging were different from those of the genuine product, with poor quality printing and different font colour. An article reported in

[14] World Health Organisation. **Clinical management of COVID-19**: https://www.who.int/publications/i/item/clinical-management-of-covid-19

[15] World Health Organisation. **International Clinical trials Registry Platform**, viewed 14 August 2020, https://www.who.int/ictrp/en/

[16] Infectious Disease Data Observatory. **Covid-19 Clinical Trials Interactive Tool**, viewed 14 August 2020, https://www.iddo.org/tool/covid-19-clinical-trials-interactive-tool

[17] World Health Organisation. **1st Invitation to Manufacturers of therapeutics against COVID-19 to submit an Expression of Interest (EOI) for Product Evaluation to the WHO Prequalification Unit**, viewed 14 August 2020, https://extranet.who.int/prequal/sites/default/files/documents/EOI-COVID-19_v1.pdf

[18] Express pharma. **Haryana FDA seizes 86 remdesivir vials to foil black marketing attempt**, Sharma U, viewed 13 August 2020, https://www.expresspharma.in/covid19-updates/haryana-fda-seizes-86-remdesivir-vials-to-foil-black-marketing-attempt/

[19] BBC News. **Fake pharmaceutical industry thrives in West Africa**, viewed 16 August 2020, https://www.bbc.com/news/world-africa-53387216

July about additional seizures in Cameroon of 240 cartons of falsified chloroquine (report ID: 651447).

Immunomodulators

In India falsified tocilizumab injections were detected (report ID: 653142; 667788). A doctor alerted the Gujarat's FDA on ineffective Actemra 250mg, said to be manufactured by Genic Pharma. Securing Industry reported on two Ukrainian men who admitted selling falsified pembrolizumab in the US[20]. The men were already in custody since 2019 but the case shows the existing risk of falsifications of high-value pharmaceutical products. Both tocilizumab and pembrolizumab are currently being trialed for their use in COVID-19 patients; if they are shown to be efficacious more SF products can be expected.

Other trial medicines

The Indian CDSCO released the results of their monthly routine quality tests. Some of the medicines that failed testing have the same active pharmaceutical ingredients as COVID-19 trial medicines. In June samples of telmisartan, amoxicillin-potassium clavulanate, and calcium with vitamin D3 failed tests (report ID: 658934).

At the end of June, United States (US) Customs and Border Protection seized sildenafil tablets that were illegally brought into the US (report ID: 664310). Dexmedetomidine, an injectable sedative drug, is one of the drugs with increased demand during the COVID-19 outbreak. The drug has been in shortage in the US since beginning of April[21]. In July Fresenius Kabi recalled two lots in the US due to cross-contamination with lidocaine (report ID: 659370).

7 Annexes

The annexes contain the reports generated by the MQM-Globe using pre-defined search terms. The report IDs (six digits code) discussed in section 6 'Lay literature' are detailed in the annexes. To consult the report IDs, please see the extended version, containing the annexes, and/or consult the online MQM Globe[22], using the report ID in the search box.

[20] Securing Industry. **Ukrainians admit selling fakes of Merck's Keytruda in US.** Taylor P, viewed 13 August 2020, https://www.securingindustry.com/pharmaceuticals/ukrainians-admit-selling-fakes-of-merck-s-keytruda-in-us/s40/a12013/#.XzVWOigzawU

[21] US Food and Drug Administration. **FDA Drug Shortages**, viewed 10 August 2020, https://www.accessdata.fda.gov/scripts/drugshortages/dsp_ActiveIngredientDetails.cfm?AI=Dexmedetomidine%20Injection&st=c

[22] Infectious Disease Data Observatory. **Medicine Quality Monitoring Globe**: https://www.iddo.org/medicine-quality-monitoring-globe