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# Availability, cost and affordability of essential medicines for chronic respiratory diseases in low-income and middle-income countries: a cross-sectional study

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## ABSTRACT

Contemporary data on the availability, cost and affordability of essential medicines for chronic respiratory diseases (CRDs) across low-income and middle-income countries (LMICs) are missing, despite most people with CRDs living in LMICs. Cross-sectional data for seven CRD medicines in pharmacies, healthcare facilities and central medicine stores were collected from 60 LMICs in 2022–2023. Medicines for symptomatic relief were widely available and affordable, while preventative treatments varied widely in cost, were less available and largely unaffordable. There is an urgent need to address these issues if the Sustainable Development Goal 3 is to be achieved for people with asthma by 2030.

## INTRODUCTION

The forthcoming High-Level Meeting of the United Nations General Assembly on Non-Communicable Diseases (NCDs) will address the 15 million premature deaths from NCDs annually, most of which occur in low-income and middle-income countries (LMICs).[1] The United Nations Sustainable Development Goals (SDGs) demand 'safe, effective, quality and affordable essential medicines for all' by 2030.[2] Non-communicable chronic respiratory diseases (CRDs), for example, asthma and chronic obstructive pulmonary disease (COPD), cause substantial morbidity and mortality, disproportionately affecting those living in poverty in LMICs.[3] Recommended medicines for CRDs include inhaled and oral drugs that are on the WHO Model List of Essential Medicines (EML), which defines safe, efficacious, cost-effective medicines that should be available everywhere.[4] Access to essential, affordable CRD medicines is limited in LMICs.[5 6] Up-to-date data on the availability, cost and affordability of WHO essential medicines for CRDs in LMICs are missing.

## METHODS

This cross-sectional survey of medication availability and cost was completed by healthcare professionals working in LMICs (online supplemental appendix). Professionals collected standardised data from three facilities (pharmacy, healthcare facility (HCF) and central medicine store (CMS)) in each country. Prices (US$) for 1-month treatment were compared. Affordability was defined by 1-month treatment costing the lowest paid government worker <1 day's wage, as per established methodology.[7]

## RESULTS

Data from 60 LMICs were collected between June 2022 and April 2023 (online supplemental appendix). 18 countries were low income, 24 lower middle income and 17 upper middle income. The sub-Saharan African region was best represented (27 countries). Information for all three facilities was submitted for 42/60 (70%) countries. Information for pharmacies, HCFs and CMS was provided by 57, 56 and 46 LMICs, respectively. Most pharmacies were private (89%), most HCFs were public institutions (80%).

### Inhaled short-acting beta agonists

Inhaled short-acting beta agonist (SABA) was available in 93% of pharmacies, 79% of HCFs and 78% of CMS (table 1, figure 1, online supplemental appendix). The median cost of 1-month treatment in pharmacies was $2.95 (IQR $1.99–4.97), $2.34 (IQR $1.38–3.86) in HCFs and $1.39 (IQR $1.20–2.83) in CMS. SABAs were both available and affordable in 51% (29/57) of all pharmacies and 61% (31/56) of all HCFs that submitted data.

### Inhaled corticosteroids

Beclomethasone 100 mcg/dose, or equivalent, was available in 54% of pharmacies, 55% of HCFs and 48% of CMS (table 1, figure 1, online supplemental appendix). The median costs were $5.40 (IQR $2.12–8.60) in pharmacies, $3.01 (IQR $1.21–5.89) in HCFs and $1.16 (IQR $0.11–3.24) in CMS. Inhaled corticosteroids (ICS) were both available and affordable in 30% (17/57) of pharmacies and 36% (20/56) of HCFs.

### Combination inhaled corticosteroid–long-acting beta agonists

Budesonide-formoterol 200+6 mcg/dose, or equivalent, was available in 54% of pharmacies, 38% of HCFs and 20% of CMS (table 1, figure 1, online supplemental appendix). The median costs were



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**Table 1** Comparisons of availability and costs for 1-month treatment for standardised SABA, ICS, ICS-LABA and LAMA formulations in pharmacy, HCF and CMS

| | Medicine | | | | | |
|---|---|---|---|---|---|---|
| Facility | SABA | ICS | ICS-LABA (100+6 mcg/dose) | ICS-LABA (200+6 mcg/dose) | LAMA | 5-day oral OCS* |
| Pharmacy | | | | | | |
| Availability | 53/57 (93%) | 31/57 (54%) | 22/57 (39%) | 31/57 (54%) | 26/57 (46%) | 47/57 (82%) |
| Median cost (IQR, US$) | 2.95 (1.99–4.97) | 5.40 (2.12–8.60) | 19.71 (12.00–42.00) | 19.20 (9.73–27.43) | 30.53 (9.45–47.29) | 1.65 (0.60–3.29) |
| Median DOW (IQR) | 0.8 (0.2–1.8) | 0.6 (0.3–3.5) | 4.3 (2.6–8.3) | 4.1 (1.9–6.9) | 3.5 (1.4–5.8) | 0.3 (0.1–1.0) |
| HCF | | | | | | |
| Availability | 44/56 (79%) | 31/56 (55%) | 10/56 (18%) | 21/56 (38%) | 16/56 (29%) | 40/56 (71%) |
| Median cost (IQR, US$) | 2.34 (0.1–1.0) | 3.01 (1.21–5.89) | 16.49 (12.03–26.55) | 18.41 (11.30–24.49) | 26.01 (15.32–36.70) | 0.02 (0.01–0.08) |
| Median DOW (IQR) | 0.4 (0.1–1.9) | 0.5 (0.1–1.8) | 3.2 (2.2–4.4) | 3.5 (1.5–6.1) | 3.3 (1.4–5.6) | 0.01 (0–0.03) |
| CMS | | | | | | |
| Availability | 36/46 (78%) | 22/46 (48%) | 7/46 (15%) | 9/46 (20%) | 11/46 (24%) | 35/46 (76%) |
| Median cost (IQR, US$) | 1.39 (1.20–2.83) | 1.16 (0.11–3.24) | 26.48 (13.31–29.85) | 7.14 (3.90–8.13) | 17.98 (0.98–32.17) | 0.02 (0.01–0.03) |

Availability: number of facilities where medicine is available by total number of facilities that submitted data. See the online supplemental appendix for definitions of standardised formulations. *Standardised formulation for OCS is 5-day course of oral prednisolone, 40 mg once a day using 5 mg tablets. CMS costs are wholesale costs, unsuitable for affordability/days of work calculations. CMS, central medicine stores; DOW, days of work required to pay for 1-month treatment; HCF, healthcare facility; ICS, inhaled corticosteroid; ICS-LABA, inhaled corticosteroid–long-acting beta agonist (formoterol) combination; LAMA, long-acting muscarinic antagonist inhaler; OCS, oral corticosteroids; SABA, short-acting beta agonist inhaler.

$19.20 (IQR $9.73–27.43) in pharmacies, $18.41 (IQR $11.30–24.49) in HCFs and $7.14 (IQR $3.90–8.13) in CMS. Overall, it was both available and affordable in 11% (6/57) of pharmacies and 5% (3/56) of HCFs. Costs for budesonide-formoterol 100+6 mcg/dose were similar, but it was less available.

### Long-acting anti-muscarinic antagonists

A standardised long-acting muscarinic antagonist (LAMA) formulation was available in 46% of pharmacies, 29% of HCFs and 24% of CMS (table 1, figure 1, online supplemental appendix). The median costs were $30.53 (IQR $9.45–47.29) in pharmacies, $26.01 (IQR $15.32–36.70) in HCFs and $17.98 (IQR $0.98–32.17) in CMS. LAMAs were available and affordable in 7% (4/57) of pharmacies and 4% (2/56) of HCFs.

### Other essential medicines, WHO regions and income groups

Oral prednisolone was affordable and available between 70% and 80% of facilities (table 1). Other medicines were less available (online supplemental appendix). There were variations which region and income groups had the cheapest and most affordable medicines across facilities.

## DISCUSSION

This is the largest cross-sectional study of availability, cost and affordability of CRD medicines in LMICs to date. It included data from 60 LMICs, representing 84% of the global LMIC population, and 16 of the 20 most populous LMICs.

Inhaled SABA and prednisolone were almost universally available. There were large cost ranges, SABAs were the cheapest inhalers. Medicines were cheaper in HCFs than pharmacies and price typically increased between CMS and pharmacy/HCF. In some countries medicines were free or subsidised.

We identified improvement in inhaled corticosteroid–long-acting beta agonist (ICS-LABA) availability compared with the last decade, with ICS-LABA now being available in more than half of pharmacies, and one-third of HCFs, possibly because of inclusion in the WHO EML and international guidelines.[6] SABA and ICS availability in HCFs and CMS also improved compared with previously.[5]

Acute, symptomatic treatments (SABA, prednisolone) for CRDs were more affordable than daily treatments needed to reduce morbidity and mortality (ICS, ICS-LABA, LAMA). Guidelines recommend that first-line asthma treatment should be ICS-LABA, or ICS whenever SABA is taken.[8] However, our findings suggest that these recommendations are largely unaffordable, and economic realities may force patients to use cheaper, riskier approaches.[8]

The median daily wage was $4.33 (IQR $2.17–9.55) providing an indication of 'affordability' for a month's treatment, but acknowledging that many earn less than the lowest paid government worker. Making ICS-formoterol (median cost at least $16.49) affordable like this, or by benchmarking against SABA, could achieve a tipping point for the widespread adoption of anti-inflammatory reliever asthma therapy, especially considering the greater efficacy of ICS-formoterol.[8] A similar approach to LAMA pricing could improve COPD management.[9]

Our study had several strengths. Data came from all income levels and regions and represented a large proportion of those living in LMICs. Comparisons were possible by using standardised data collection derived from established tools. Patient experience was reflected, as we presented a snapshot of the facility on the data collection day.

The study had some weaknesses. It was conducted over 11 months. Costs were compared using US$, dependent on exchange rates. Median price ratios were previously used for benchmarking, but the reference prices are out of date and no longer recommended.[7] Convenience sampling introduced possible selection bias towards better equipped facilities in urban areas. Mostly only one facility was sampled per country. We did not assess medicine quality, expiry date nor data from multiple time points.

Establishing national CRD strategies that include medicines, generating country-specific data, buy-in from global organisations and patient advocacy are key to improving medicine access by addressing in-country demand and political commitment.[10] Cost-effectiveness data for inhaled medicines specific for LMICs are needed, given that they reduce exacerbations and hospitalisations, which substantially drive the costs of CRDs.[9] There is an

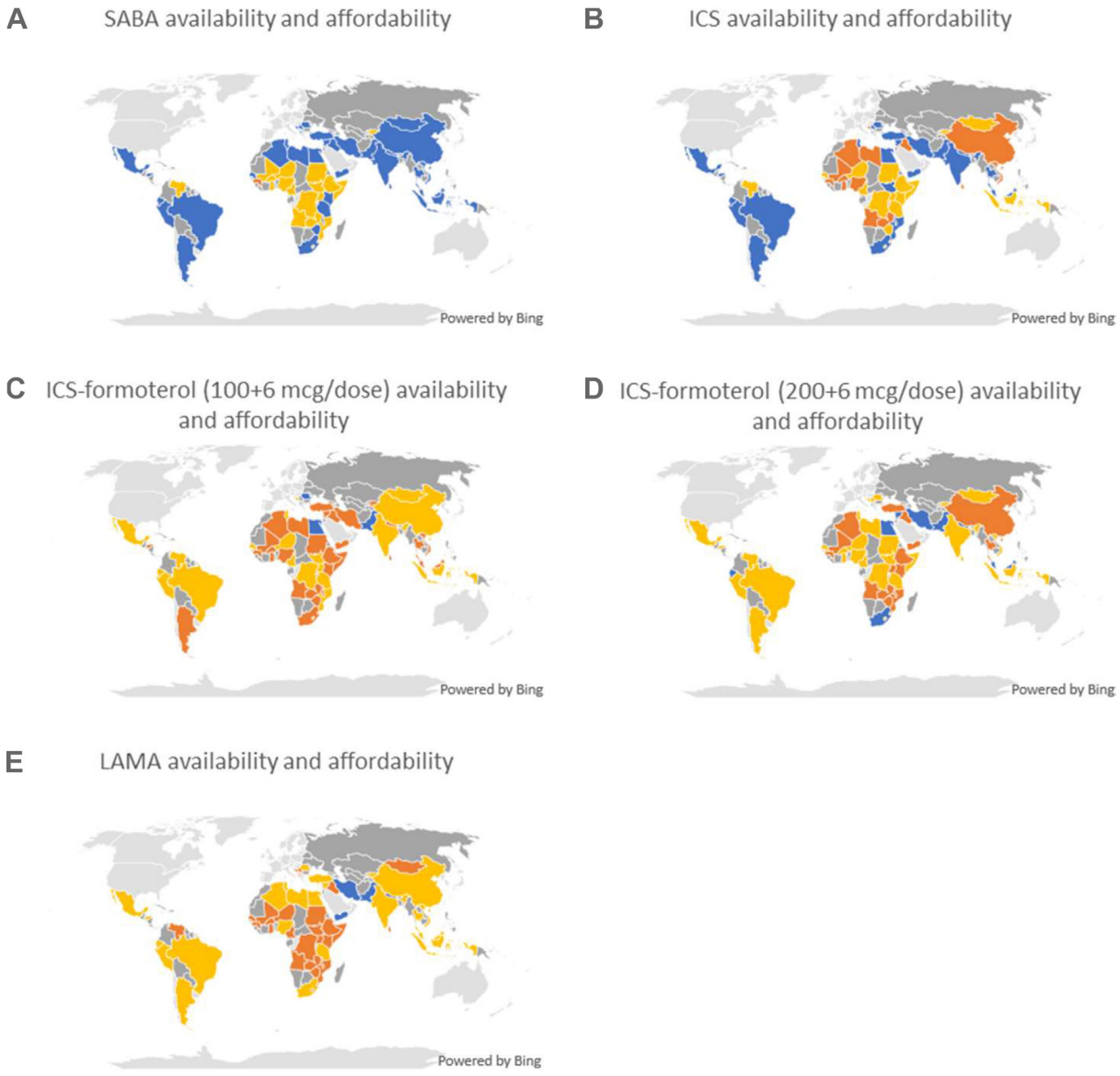


**Figure 1** Availability and affordability of standardised (A) SABA, (B) ICS, (C) ICS-LABA (100+6 mcg/dose), (D) ICS-LABA (200+6 mcg/dose) and (E) LAMA formulations in pharmacy or HCF. Blue: available and affordable. Yellow: available but not affordable. Orange: unavailable. Grey: low-income and middle-income country (LMIC), no information. HCF, healthcare facility; ICS, inhaled corticosteroid; ICS-LABA, inhaled corticosteroid–long-acting beta agonist (formoterol) combination; LAMA, long-acting muscarinic antagonist inhaler; SABA, short-acting beta agonist inhaler.

urgent need to address the availability and affordability of essential CRD medicines if SDGs are to be achieved for all by 2030.

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**Contributors** MS and KM devised the study. OBO, SJ, DMGH, RN, JM and CP provided input on the protocol. All Chronic Respiratory Diseases Medicines Survey Investigators contributed to data collection. MS completed the analysis with KM, and both assessed and verified the data. MS wrote a first draft, with input from KM, OBO, SJ, DMGH, RN, BWA, JM and CP. All investigators were invited to comment on a second draft. All had full access to all the data in the study and had final responsibility to submit for publication.

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*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

# Appendix

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*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

# Full Methods

## Study design and data collection

This was a cross-sectional survey of medication availability and cost which was completed by healthcare professionals working in LMICs in 2022-2023. We followed STROBE guidelines and gained ethical approval from Liverpool School of Tropical Medicine (Supplementary data).[1] Investigators completed a standardised electronic data collection form covering demographics, availability and costs of essential medicines using kobotoolbox.[2] All investigators gave informed consent and gained local approval where necessary.

The data collection form used was based on established WHO methodology.[3,4] Essential medicines were defined by the WHO EML (Table 1).[5] Availability, strength, pack size and cost were recorded for generic and originator essential medicines. Originator brands were defined by the WHO "Database of medicine prices, availability, affordability and price components" as the products that were first authorised for marketing worldwide.[4] Investigators could also manually add medicines. Investigators entered the price that a patient would pay in the pharmacy or healthcare facility (e.g. clinic, hospital; HCF) that day for the cheapest product. Prices for the central medicine store or national procurement centre (CMS) were usually wholesale prices, and hence affordability was not calculated, as patients would be unable to purchase at this price themselves. Investigators provided photos to verify medicines and prices.

**Table 1: Standardised doses and preparations for one month's treatment for essential medicines for chronic respiratory diseases, derived from WHO EMLO[5]**

*Originator: product that was first authorised for marketing worldwide; (1): Inhaled beclomethasone and budesonide were considered equipotent.

| Product | Drug class | Preparation | Standardised preparation for one month's treatment |
|---|---|---|---|
| Salbutamol | Short-acting beta-agonist (SABA) | 100 mcg / dose, inhaler<br>5 mg / ml, nebuliser<br>50 mcg / mL, injection<br><br>[Originator*: Ventolin, GlaxoSmithKline] | 100 mcg / dose, 200 doses, inhaler |
| Beclomethasone (1) | Inhaled corticosteroid (ICS) | 50 mcg / dose, inhaler<br>100 mcg / dose, inhaler<br><br>[Originator*: Becotide, GlaxoSmithKline] | 100 mcg / dose, 200 doses, inhaler |
| Budesonide (1) | Inhaled corticosteroid (ICS) | 100 mcg / dose, inhaler<br>200 mcg / dose, inhaler<br><br>[Originator*: Pulmicort, AstraZeneca] | 100 mcg / dose, 200 doses, inhaler |
| Budesonide and formoterol | Combination inhaled corticosteroid-long-acting beta-agonist (ICS-LABA) | 100 + 6 mcg / dose, dry powder inhaler<br>200 + 6 mcg / dose, dry powder inhaler<br><br>[Originator*: Symbicort, AstraZeneca] | 100 + 6 mcg / dose, 120 doses, inhaler<br>200 + 6 mcg / dose, 120 doses, inhaler |
| Tiotropium | Long-acting muscarinic antagonist (LAMA) | 18 mcg / dose, capsule<br>1.25 mcg / dose, actuation<br>2.5 mcg / dose, actuation<br><br>[Originator*: Spiriva, Boehringer-Ingelheim] | 18 mcg / dose, 30 doses, inhaler<br>1.25 mcg / dose, 60 doses, inhaler<br>2.5 mcg / dose, 60 doses, inhaler |
| Prednisolone | Corticosteroid (CS) | 5 mg tablet<br>25 mg tablet<br>5 mg / mL oral liquid | 40 mg / day for 5 days, oral |
| Ipratropium bromide | Short-acting muscarinic antagonist (SAMA) | 20 mcg / dose, inhaler<br><br>[Originator*: Atrovent, Boehringer-Ingelheim] | 20 mcg / dose, 200 doses, inhaler |
| Epinephrine / Adrenaline | Adrenaline (AD) | 1mg / 1ml, injection | 1 mg / ml / dose, 1 ampoule, injection |

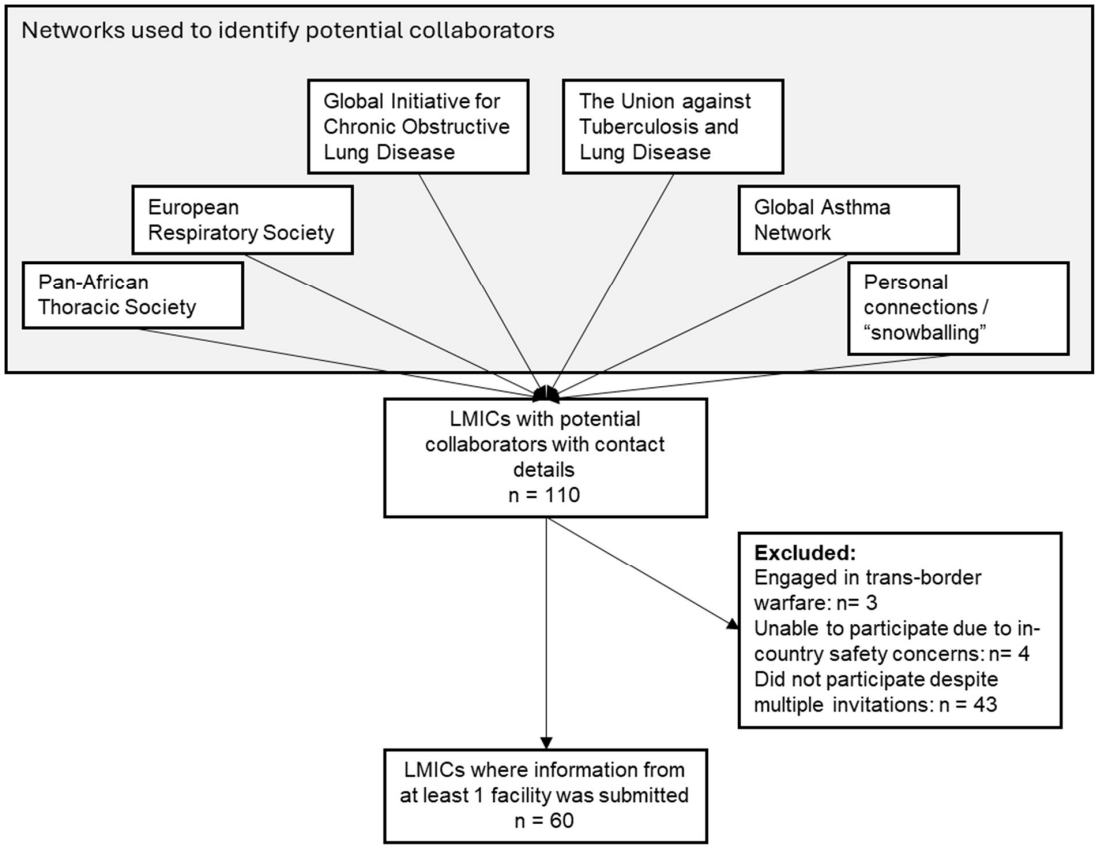
Each investigator was asked to complete the form for three facilities: one pharmacy, one HCF and CMS. Public, private, and other facilities were included and chosen using convenience sampling. Investigators visited or contacted each facility to complete the data collection form. Data for at least one facility per country had to be

submitted and multiple entries were allowed. If facilities were missing, the author (MS) contacted other investigators or used publicly available data to complete the dataset.

**Sampling and recruitment**

Investigators were recruited through international respiratory networks and "snowballing" aiming to include as many LMICs as possible (Figure 1). LMICs were defined by 2022 World Bank category.[6]

**Figure 1: Flowchart of sampling strategy for potential collaborators.**




**Data analysis**

For each country the availability and cost of each medicine at the specified doses was reported for each of the facility types. When multiple doses were available, standardised doses were calculated which represented one month's treatment, or one course of treatment (Table 1). A medicine was available if it was present in the facility on the day of data collection. Medicine prices were expressed in local currency and converted to US$, using mean daily or monthly exchange rates.[7] A medicine was affordable if one month's treatment cost less than one day's wage of the lowest paid government worker, defined by national minimum wage defined by the International Labour Organization.[8] Affordability was only calculated for pharmacies and HCFs as CMS prices were usually wholesale prices. The costs of the cheapest products by facility were compared across countries. If there were multiple submissions for one facility the best availability and cost were presented. Descriptive analyses were applied throughout.

The funder had no role in study design, data collection, data analysis, data interpretation, or writing of the manuscript.

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 1: Chronic Respiratory Diseases (CRDs) Medicines Survey Investigators

| Country | First name | Surname | Affiliation |
|---|---|---|---|
| Albania | Eris | Mesonjesi | University Hospital Center Mother Teresa, Tirana |
| Algeria | Nadia | Ait-Khaled | Algeria University |
| Algeria | Samya | Taright | Universite d'Alger, Faculté de Medecine |
| Argentina | Santiago | Larrateguy | Universidad Adventista del Plata / Centro Privado de Medicina Respiratoria |
| Bosnia and Herzegovina | Sanela | Domuz Vujnovic | Paediatrics Clinic, University Clinical Center of Republic of Srpska |
| Brazil | Carolina | Barbosa Souza Santos | Programa para o Controle da Asma na Bahia - ProAR (Program for Control of Asthma in Bahia) |
| Burkina Faso | Abdoul Risgou | Ouédraogo | Health Training & Research Unit, Joseph KI-ZERBO University, Ouagadougou, Burkina Faso and Department of Medicine, Tengandogo University Hospital Center |
| Cameroon | Bertrand Hugo | Mbatchou-Ngahane | Douala General Hospital, University of Douala, Cameroon |
| Cameroon | Lydie | Mboumi | Pharmacie du Rocher, Douala, Cameroon |
| China | Yanping | Liu | Sun Yat-sen university |
| China | Fu-Qiang | Wen | West China Hospital, Sichuan University |
| China | Xi | Yan | West China Hospital, Sichuan University |
| China | Yutian | Zhang | West China Hospital, Sichuan University |
| Congo, Dem. Rep. | Patrick | Katoto | Center for Tropical Diseases and Global Health, Université Catholique de Bukavu |
| Congo, Dem. Rep. | Arsene Daniel | Nyalundja | Center for Tropical Diseases and Global Health, Université Catholique de Bukavu, Democratic Republic of Congo |
| Ecuador | Efraín | Sánchez-Angarita | Centro de Investigacion respiratorio |
| Egypt, Arab Rep. | Maged | Hassan | Alexandria University Faculty of Medicine |
| Egypt, Arab Rep. | Magda | Afifi | National Tuberculosis Control Program, Ministry of health and population |
| Eswatini | Willie | Siduna | University of the Western Cape |
| Ethiopia | Amsalu | Binegdie | College of Health Sciences,Addis Ababa University |
| Gambia, The | Babatunde | Awokola | Liverpool School of Tropical Medicine and Medical Research Council Unit The Gambia at London School of Hygiene and Tropical Medicine |
| Ghana | Rafiuk Cosmos | Yakubu | Tamale Teaching Hospital (TTH) and School of Medicine, University for Development Studies (UDS) |
| Guinea | Magassouba | Aboubacar Sidiki | National Tuberculosis Control Program,Conakry, Guinea |
| Honduras | Suyapa | Sosa | Pulmonary Medicine/Thorax National Institute |
| India | Sarbjeet | Khurana | IHBAS Hospital |
| Indonesia | Bony Wiem | Lestari | Research Center for Care and Control of Infectious Diseases (RC3ID) Universitas Padjadjaran, Bandung-Indonesia |
| Indonesia | Faisal | Yunus | Department of Pulmonology and Respiratory medicine, faculty of medicine universitas Indonesia - Persahabatan Hospital |
| Indonesia | Antonia Morita Iswari | Saktiawati | Universitas Gadjah Mada, Faculty of Medicine, Public Health, and Nursing, Department of Internal Medicine<br>Universitas Gadjah Mada, Faculty of Medicine, Public Health, and Nursing, Center for Tropical Medicine |
| Iran, Islamic Rep. | Mohammad Reza | Masjedi | Pulmonary Medicine, Shahid Beheshti University of Medical Sciences<br>Cancer Control Research Center, Cancer Control Foundation, Iran University of Medical Sciences, Tehran, Iran<br>Tobacco Control Research Center (TCRC), Iranian Anti-tobacco Association, Iran University of Medical Sciences, Tehran, Iran. |
| Iraq | Hashim | Talib Hashim | University of Warith Al-anbya, Colleges of Medicine, Karbala, Iraq |
| Kenya | Peter | Owiti | Stop TB Partnership / Wote Youth Development Projects |
| Kyrgyz Republic | Shaiirbek | Sulaimanov | Kyrgyz-Russian Slavic University and Kyrgyz State Medical Academy |
| Lesotho | Lawrence | Oyewusi | Partners In Health |
| Libya | Boshra | Abusahmin | National Centre For Disease Control |
| Libya | Mohamed Hadi Mohamed | Abdelhamid | National Center for Disease Control (NCDC). Biotechnology Research Center (BTRC). Tripoli-Libya. |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | |
|---|---|---|---|
| Malawi | Felix | Mkandawire | Blantyre Malaria Project |
| Malaysia | Ee Ming | Khoo | Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya; International Primary Care Respiratory Group |
| Mali | Ousmane Ibrahim | Diabate | Bamako |
| Mexico | Adrian | Rendon | CIPTIR, Hospital Universitario "Dr. Jose Eleuterio Gonzalez", UANL |
| Mexico | Berenice | Soto-Moncivais | CIPTIR, Hospital Universitario “Dr. Jose Eleuterio Gonzalez”, UANL |
| Mongolia | Bolyskhan | Baigabyl | Tuberculosis clinic, National Center for Communicable Diseases |
| Mozambique | Celso | Khosa | Instituto Nacional de Saúde- Centro de Investigação e Treino em Saúde da Polana Caniço (CISPOC), Marracuene, Mozambique |
| Mozambique | Cynthia | Silva | Instituto Nacional de Saúde- Centro de Investigação e Treino em Saúde da Polana Caniço (CISPOC), Marracuene, Mozambique |
| Nepal | Rajan | Paudel | Birat Nepal Medical Trust |
| Niger | Alberto | Piubello | Damien Foundation, Niamey, Niger |
| Niger | Kadri | Sani | Centre Hospitalier Régional, Niamey, Niger |
| Nigeria | Temitope | Fapohunda | Lagos State University Teaching Hospital, Nigeria |
| Nigeria | Olayinka | Adeyeye | Lagos State University, College of Medicine |
| North Macedonia | Valentina | Cvejoska Cholakovska | University Children's Clinic, Faculty of Medicine, Skopje, Ss Cyril and Methodius University of Skopje |
| Pakistan | Ghulam | Mustafa | College of Medicine Shaqra University Riyadh, Nishtar medical university, Multan |
| Peru | Javier | Cabrera-Sanchez | Facultad de Medicina, Universidad Peruana Cayetano Heredia, Lima, Peru |
| Romania | Diana | Deleanu | University of Medicien & Pharmacy Iuliu hatieganu |
| Rwanda | Jean Pierre | Sibomana | Butare University teaching hospital |
| Senegal | Momar | Mbodji | Dakar |
| Serbia | Vesna | Vekovic | Children's Hospital for Lung Diseases and Tb, University Hospital Dr Dragisa Misovic,Belgrade, Serbia |
| Serbia | Zorica | Zivkovic | Children's Hospital for Lung Diseases and Tb, University Hospital Dr Dragisa Misovic, Belgrade, Serbia<br>Faculty of Pharmacy in Novi Sad, University Business Academy Novi Sad, Serbia |
| Somalia | Osman Muhyadin | Abdulle | Forlanini Hospital,National Tuberculosis Program and Somaville University,,Mogadishu, Somalia |
| South Sudan | Babiker | Adam | M-Pharma co Ltd |
| Sri Lanka | Sisira | Siribaddana | Rajarata University of Sri Lanka, Teaching Hospital Anuradhapura |
| Sudan | Rana | Ahmed | The Epidemiological Laboratory, Khartoum, Sudan |
| Sudan | Mahdia | Elhadi | University of Hail |
| Sudan | Mohamed | Elmustafa | University of Gezira; Wad Medani College of Medical Sciences and Technology |
| Syrian Arab Republic | Yousser | Mohammad | Tishreen University, Latakia; Al Sham Private University, Damascus, Syria |
| Tanzania | Stellah | Mpagama | Kibong'oto Infectious Diseases Hospital |
| Tanzania | Bibie | Said | Kibong'oto Infectious Diseases Hospital |
| Thailand | Mongkol | Lao-Araya | Chiang Mai University Hospital, Faculty of Medicine, Chiang Mai University |
| Timor-Leste | Benilda Trias | de Gula | Saint Paul Clinic of the Sisters of St. Paul of Chartres Congregation |
| Tunisia | Agnes | Hamzaoui | Hopital A Mami, Ariana and Medicine School, Tunis |
| Turkiye | Kübra | Tunçel | University of Gazi |
| Turkiye | Islam | Sangac | |
| Turkiye | Tuğçe | Tayyar | Lavanta Pharmacy |
| Turkiye | Aygün | Gürgöze | Polatlı Can Hospital |
| Uganda | Rebecca | Nantanda | Makerere University Ung Institute, College of Health Sciences, Makerere University |
| Venezuela | Maria | Montes de Oca | Universidad Central de Venezuela, Centro Medico de Caracas |
| Venezuela | Juan | Catari | Centro Medico de Caracas |
| Vietnam | Tran Thien Quan | Vu | University of Medicine and Pharmacy at Ho Chi Minh city |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | |
|---|---|---|---|
| Yemen, Rep. | Mohammed | Mohammed | Al Taaon pharmacy |
| Yemen, Rep. | Ruba | Khaled | |
| Yemen, Rep. | Weiam | Hussein | |
| Zambia | Charles | Mataya Mphuka | Livingstone Central Hospital |
| Zimbabwe | Terrence | Rudado Musekiwa | Chimhanda District Hospital |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 2: STROBE Statement[1]

| | Item No. | Recommendation | Page No. |
|---|---|---|---|
| **Title and abstract** | 1 | (*a*) Indicate the study's design with a commonly used term in the title or the abstract | 1 |
| | | (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found | 3 |
| **Introduction** | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | 4 |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | 4 |
| **Methods** | | | |
| Study design | 4 | Present key elements of study design early in the paper | 4, Appendix |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 4, Appendix |
| Participants | 6 | (*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up<br>*Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls<br>*Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants | 4, Appendix |
| | | (*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed<br>*Case-control study*—For matched studies, give matching criteria and the number of controls per case | N/A |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 4, Appendix |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | 4, Appendix |
| Bias | 9 | Describe any efforts to address potential sources of bias | 4, Appendix |
| Study size | 10 | Explain how the study size was arrived at | 4, Appendix |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | 4, Appendix |
| Statistical methods | 12 | (*a*) Describe all statistical methods, including those used to control for confounding | 4, Appendix |
| | | (*b*) Describe any methods used to examine subgroups and interactions | 4, Appendix |
| | | (*c*) Explain how missing data were addressed | 4, Appendix |
| | | (*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed<br>*Case-control study*—If applicable, explain how matching of cases and controls was addressed<br>*Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy | N/A |
| | | (*e*) Describe any sensitivity analyses | N/A |
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | 4 |
| | | (b) Give reasons for non-participation at each stage | N/A |
| | | (c) Consider use of a flow diagram | N/A |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | 4, Appendix |
| | | (b) Indicate number of participants with missing data for each variable of interest | Appendix |
| | | (c) *Cohort study*—Summarise follow-up time (eg, average and total amount) | N/A |
| Outcome data | 15* | *Cohort study*—Report numbers of outcome events or summary measures over time | |
| | | *Case-control study*—Report numbers in each exposure category, or summary measures of exposure | |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | |
|---|---|---|---|
| | | *Cross-sectional study*—Report numbers of outcome events or summary measures | 4-7, Appendix |
| Main results | 16 | (*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | 4-7, Appendix |
| | | (*b*) Report category boundaries when continuous variables were categorized | 4-7, Appendix |
| | | (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | N/A |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | 4-7, Appendix |
| Key results | 18 | Summarise key results with reference to study objectives | 8 |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | 8 |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | 8 |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | 8 |
| **Other information** | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | 9 |

Information on the STROBE Initiative is available at www.strobe-statement.org.

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 3: Overview of included LMICs and facilities by income group and WHO region

LMIC: Low-income and middle-income country; WHO: World Health Organization; HCF: Healthcare facility; CMS: Central medicine stores; No information: NIA available; NGO: Non-governmental organisation.

(1) Data for 3 private pharmacies submitted; (2) Data for 2 private pharmacies submitted; (3) Data for 2 private pharmacies submitted; (4) Data for 3 HCFs submitted, 2 public and 1 private HCF; (5) Data for 2 public HCFs submitted; (6) Data for 3 pharmacies submitted, 2 pubic and 1 private pharmacy.

| **Country** | **World Bank Income Group**[6] | **WHO Region**[9] | **Pharmacy – type of facility** | **HCF – type of facility** | **CMS – type of facility** |
|---|---|---|---|---|---|
| Albania | Upper middle income | Europe | Private | Public | NIA |
| Algeria | Lower middle income | Africa | Private | Public | CMS |
| Angola | Lower middle income | Africa | Private | Public | CMS |
| Argentina | Upper middle income | Americas | Private | Public | CMS |
| Bosnia and Herzegovina | Upper middle income | Europe | Private | Public | NIA |
| Brazil | Upper middle income | Americas | Private | Public | CMS |
| Burkina Faso | Low income | Africa | Private | Public | NIA |
| Cameroon | Lower middle income | Africa | Private | Public | CMS |
| Chad | Low income | Africa | NIA | NIA | CMS |
| China | Upper middle income | Western Pacific | Private (1) | Public | CMS |
| Democratic Republic of Congo | Low income | Africa | Private | Public | CMS |
| Ecuador | Upper middle income | Americas | Private | Private | CMS |
| Egypt | Lower middle income | Eastern Mediterranean | Private (2) | Private | CMS |
| Eswatini | Lower middle income | Africa | Private | NIA | CMS |
| Ethiopia | Low income | Africa | Private | Public | CMS |
| Ghana | Lower middle income | Africa | Private | Public | CMS |
| Guinea | Low income | Africa | Private | NIA | CMS |
| Honduras | Lower middle income | Americas | Private | Public | NIA |
| India | Lower middle income | South-East Asia | Private | Public | CMS |
| Indonesia | Lower middle income | South-East Asia | Private (3) | Private & Public (4) | CMS |
| Iran | Lower middle income | Eastern Mediterranean | Private | Public | CMS |
| Iraq | Upper middle income | Eastern Mediterranean | Private | Public | NIA |
| Kenya | Lower middle income | Africa | Private | Public | NIA |
| Kyrgyzstan | Lower middle income | Europe | Private | Public | CMS |
| Lesotho | Lower middle income | Africa | NIA | NGO | CMS |
| Libya | Upper middle income | Eastern Mediterranean | Private | Public | CMS |
| Malawi | Low income | Africa | Private | Public (5) | CMS |
| Malaysia | Upper middle income | Western Pacific | Private | Public | CMS |
| Mali | Low income | Africa | Private | Public | CMS |
| Mexico | Upper middle income | Americas | Private | Private | NIA |
| Moçambique | Low income | Africa | Private | Public | CMS |
| Mongolia | Lower middle income | Western Pacific | Private & Public (6) | Public | CMS |
| Nepal | Lower middle income | South-East Asia | Private | Public | CMS |
| Niger | Low income | Africa | Private | Public | CMS |
| Nigeria | Lower middle income | Africa | Private | Public | CMS |
| North Macedonia | Upper middle income | Europe | Public | Public | CMS |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | |
|---|---|---|---|---|---|
| Pakistan | Lower middle income | Eastern Mediterranean | Public | Public | CMS |
| Peru | Upper middle income | Americas | Private | Public | CMS |
| Romania | Upper middle income | Europe | Private | Public | CMS |
| Rwanda | Low income | Africa | Private | Public | NIA |
| Senegal | Lower middle income | Africa | Private | Public | CMS |
| Serbia | Upper middle income | Europe | Private | Public | CMS |
| Somalia | Low income | Eastern Mediterranean | Private | Private | NIA |
| South Africa | Upper middle income | Africa | Private | Public | CMS |
| South Sudan | Low income | Africa | Private | NIA | NIA |
| Sri Lanka | Lower middle income | South-East Asia | Private | Public | CMS |
| Sudan | Low income | Eastern Mediterranean | Private | Public | CMS |
| Syria | Low income | Eastern Mediterranean | Private | Public | CMS |
| Tanzania | Lower middle income | Africa | Private | Public | CMS |
| Thailand | Upper middle income | South-East Asia | Public | Public | NIA |
| The Gambia | Low income | Africa | Private | Public | CMS |
| Timor Leste | Lower middle income | South-East Asia | NIA | Private | NIA |
| Tunisia | Lower middle income | Eastern Mediterranean | Public | Public | CMS |
| Turkiye | Upper middle income | Europe | Private | Private | CMS |
| Uganda | Low income | Africa | Private | NGO | CMS |
| Venezuela | | Americas | Private | Private | NIA |
| Viet Nam | Lower middle income | Western Pacific | Private | Public | CMS |
| Yemen | Low income | Eastern Mediterranean | Public | Private | NIA |
| Zambia | Low income | Africa | Private | Public | CMS |
| Zimbabwe | Lower middle income | Africa | Private | Public | CMS |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 4: Availability, cost, and affordability of SABA by country and type of facility.

Cost is for standardised dose and formulation (inhaled salbutamol 100mcg/dose, 200 doses). CMS costs are wholesale costs, unsuitable for affordability calculations. Affordable: one month's treatment costs less than one day's wage of national minimum wage. $: US$; SABA: Short-acting beta-agonist inhaler; HCF: Healthcare facility; CMS: Central medicine stores; NIA: No information available; DRC: Democratic Republic of Congo; NGO: Non-governmental organisation.

| Country | Minimum daily wage ($) | Pharmacy | | | | HCF | | | | CMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type of facility | SABA available? | SABA cost ($) | SABA affordable? | Type of facility | SABA available? | SABA cost ($) | SABA affordable? | SABA available? | SABA cost ($) |
| Albania | 11.09 | Private | Yes | 0.00 | Yes | Public | Yes | 1.56 | Yes | NIA | NIA |
| Algeria | 5.39 | Private | Yes | 0.00 | Yes | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Angola | 2.46 | Private | Yes | 4.96 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 1.39 |
| Argentina | 15.60 | Private | Yes | 9.40 | Yes | Public | Yes | 2.94 | Yes | Yes | 5.60 |
| Bosnia and Herzegovina | 10.89 | Private | Yes | 2.61 | Yes | Public | Yes | 2.70 | Yes | NIA | NIA |
| Brazil | 8.86 | Private | Yes | 0.00 | Yes | Public | Yes | 0.00 | Yes | Unavailable | Unavailable |
| Burkina Faso | 2.13 | Private | Yes | 3.68 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Cameroon | 2.23 | Private | Yes | 3.20 | Unaffordable | Public | Yes | 4.16 | Unaffordable | Yes | 1.33 |
| Chad | 3.70 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | Yes | NIA |
| China | 10.62 | Private | Yes | 3.40 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 2.83 |
| DRC | 3.54 | Private | Yes | 4.00 | Unaffordable | Public | Yes | 10.50 | Unaffordable | Yes | 3.00 |
| Ecuador | 15.17 | Private | Yes | 7.80 | Yes | Private | Yes | 5.65 | Yes | Yes | 1.05 |
| Egypt | 5.85 | Private | Yes | 0.61 | Yes | Private | Yes | 1.09 | Yes | Yes | 0.59 |
| Eswatini | 0.92 | Private | Yes | 2.72 | Unaffordable | NIA | NIA | NIA | NIA | Yes | 1.39 |
| Ethiopia | 0.31 | Private | Yes | 3.78 | Unaffordable | Public | Yes | 3.34 | Unaffordable | Yes | NIA |
| Ghana | 1.19 | Private | Yes | 3.50 | Unaffordable | Public | Yes | 2.28 | Unaffordable | Yes | 1.49 |
| Guinea | 2.44 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| Honduras | 14.82 | Private | Yes | 4.45 | Yes | Public | Yes | 4.12 | Yes | NIA | NIA |
| India | 2.14 | Private | Yes | 1.88 | Yes | Public | Yes | 0.65 | Yes | Yes | 0.66 |
| Indonesia | 7.22 | Private | Yes | 11.31 | Unaffordable | Private & Public | Yes | 6.44 | Yes | Yes | 1.85 |
| Iran | 20.44 | Private | Yes | 2.20 | Yes | Public | Yes | 2.20 | Yes | Yes | 2.20 |

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iraq | 9.43 | Private | Yes | 4.20 | Yes | Public | Yes | 3.50 | Yes | NIA | NIA |
| Kenya | 5.25 | Private | Yes | 2.55 | Yes | Public | Yes | 2.98 | Yes | NIA | NIA |
| Kyrgyzstan | 0.88 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 2.59 | Unaffordable | Yes | 1.62 |
| Lesotho | 3.60 | NIA | NIA | NIA | NIA | NGO | Yes | 11.54 | Unaffordable | Yes | NIA |
| Libya | 3.59 | Private | Yes | 2.90 | Yes | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malawi | 1.92 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 0.00 | Yes | Yes | 1.35 |
| Malaysia | 12.88 | Private | Yes | 2.55 | Yes | Public | Yes | 1.78 | Yes | Yes | 2.98 |
| Mali | 2.46 | Private | Yes | 7.68 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mexico | 15.07 | Private | Yes | 3.10 | Yes | Private | Yes | 14.95 | Yes | NIA | NIA |
| Moçambique | 4.80 | Private | Yes | 5.57 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mongolia | 4.85 | Private & Public | Yes | 1.00 | Yes | Public | Yes | 3.15 | Yes | Unavailable | Unavailable |
| Nepal | 4.56 | Private | Yes | 1.74 | Yes | Public | Yes | 1.62 | Yes | Yes | 0.00 |
| Niger | 2.31 | Private | Yes | 5.22 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 3.51 |
| Nigeria | 2.77 | Private | Yes | 3.12 | Unaffordable | Public | Yes | 4.08 | Unaffordable | Yes | 3.01 |
| North Macedonia | 17.37 | Public | Yes | 2.65 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 2.64 |
| Pakistan | 4.23 | Public | Yes | 0.00 | Yes | Public | Yes | 0.88 | Yes | Yes | 1.21 |
| Peru | 9.90 | Private | Yes | 1.73 | Yes | Public | Yes | 0.96 | Yes | Yes | 1.26 |
| Romania | 20.32 | Private | Yes | 2.03 | Yes | Public | Yes | 2.24 | Yes | Yes | NIA |
| Rwanda | 0.09 | Private | Yes | 2.28 | Unaffordable | Public | Yes | 2.28 | Unaffordable | NIA | NIA |
| Senegal | 3.34 | Private | Yes | 2.95 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 2.12 |
| Serbia | 16.35 | Private | Yes | NIA | NIA | Public | Yes | 1.92 | Yes | Yes | NIA |
| Somalia | 0.10 | Private | Yes | 5.14 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| South Africa | 9.37 | Private | Yes | 2.82 | Yes | Public | Yes | 0.96 | Yes | Yes | 1.00 |
| South Sudan | 5.05 | Private | Yes | 6.00 | Unaffordable | NIA | NIA | NIA | NIA | NIA | NIA |
| Sri Lanka | 1.35 | Private | Yes | 2.05 | Unaffordable | Public | Yes | 0.00 | Yes | Yes | 0.36 |
| Sudan | 0.03 | Private | Yes | 2.40 | Unaffordable | Public | Yes | 1.32 | Unaffordable | Unavailable | Unavailable |
| Syria | 0.55 | Private | Yes | 0.90 | Unaffordable | Public | Yes | 0.00 | Yes | Yes | 0.77 |
| Tanzania | 2.18 | Private | Yes | 4.00 | Unaffordable | Public | Yes | 1.80 | Yes | Yes | 1.20 |
| Thailand | 9.05 | Public | Yes | 5.27 | Yes | Public | Yes | 1.40 | Yes | NIA | NIA |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| The Gambia | 0.91 | Private | Yes | 8.19 | Unaffordable | Public | Yes | 0.00 | Yes | Yes | 3.46 |
| Timor Leste | 4.43 | NIA | NIA | NIA | NIA | Private | Yes | 25.00 | Unaffordable | NIA | NIA |
| Tunisia | 4.74 | Public | Yes | 1.94 | Yes | Public | Yes | 1.95 | Yes | Yes | NIA |
| Turkiye | 13.90 | Private | Yes | 1.94 | Yes | Private | Yes | 2.40 | Yes | Yes | 0.30 |
| Uganda | 0.07 | Private | Yes | NIA | NIA | NGO | Yes | 3.00 | Unaffordable | Yes | NIA |
| Venezuela | 0.94 | Private | Yes | 8.05 | Unaffordable | Private | Yes | 10.18 | Unaffordable | NIA | NIA |
| Viet Nam | 6.00 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 3.20 | Yes | Unavailable | Unavailable |
| Yemen | 3.23 | Public | Yes | 0.06 | Yes | Private | Yes | 8.79 | Unaffordable | NIA | NIA |
| Zambia | 2.59 | Private | Yes | 4.99 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Zimbabwe | 11.58 | Private | Yes | 9.45 | Yes | Public | Yes | 3.78 | Yes | Yes | 5.40 |



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*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 5: Availability, cost, and affordability of ICS by country and type of facility.

Cost is for standardised dose and formulation (inhaled beclomethasone or budesonide 100 mcg/dose, 200 doses). CMS costs are wholesale costs, unsuitable for affordability calculations. Affordable: one month's treatment costs less than one day's wage of national minimum wage. $: US$; ICS: inhaled corticosteroid; HCF: Healthcare facility; CMS: Central medicine stores; NIA: No information available; DRC: Democratic Republic of Congo; NGO: Non-governmental organisation.

(1): Clenil 250mcg/dose available in pharmacy; (2): Flixotide 50 mcg/dose, 125 cmg/dose, 250 mcg/dose available in pharmacy and HCF; (3): Oxalair (fluticasone) 125 mcg/dose available in pharmacy; (4): Flixotide 125 mcg/dose available in pharmacy; (5) ciclesonide 160mcg/dose available in HCF; (6): Flixotide 50 mcg/dose available in pharmacy, HCF, CMS; (7): Flixotide 50mcg/dose, 125 mcg/dose available in CMS; (8): Mometasone 50 mcg/dose available in pharmacy; (9): Fluticasone 100 mcg/dose, 125 mcg/dose available in pharmacy and HCF.

| Country | Minimum daily wage ($) | Pharmacy | | | | HCF | | | | CMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type of facility | ICS available? | ICS cost ($) | ICS affordable? | Type of facility | ICS available? | ICS cost ($) | ICS affordable? | ICS available? | ICS cost ($) |
| Albania | 11.09 | Private | Yes | 0.00 | Yes | Public | Yes | 2.87 | Yes | NIA | NIA |
| Algeria | 5.39 | Private | Unavailable (1) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Angola | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Argentina | 15.60 | Private | Yes | 6.41 | Yes | Public | Yes | 1.95 | Yes | Yes | 5.95 |
| Bosnia and Herzegovina | 10.89 | Private | Unavailable (2) | Unavailable | Unavailable | Public | Unavailable (2) | Unavailable | Unavailable | NIA | NIA |
| Brazil | 8.86 | Private | Yes | 0.00 | Yes | Public | Yes | 0.00 | Yes | Yes | 0.00 |
| Burkina Faso | 2.13 | Private | Unavailable (3) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Cameroon | 2.23 | Private | Yes | 19.20 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Chad | 3.70 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| China | 10.62 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| DRC | 3.54 | Private | Yes | 12.00 | Unaffordable | Public | Yes | 5.25 | Unaffordable | Unavailable | Unavailable |
| Ecuador | 15.17 | Private | Yes | 5.50 | Yes | Private | Yes | 7.00 | Yes | Unavailable | Unavailable |
| Egypt | 5.85 | Private | Yes | 1.39 | Yes | Private | Yes | 2.79 | Yes | Yes | 1.31 |
| Eswatini | 0.92 | Private | Yes | 8.11 | Unaffordable | NIA | NIA | NIA | NIA | Yes | 2.77 |
| Ethiopia | 0.31 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 3.01 | Unaffordable | Yes | 0.00 |
| Ghana | 1.19 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Guinea | 2.44 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Honduras | 14.82 | Private | Yes | 6.24 | Yes | Public | Yes | 14.42 | Yes | NIA | NIA |
| India | 2.14 | Private | Yes | 2.24 | Unaffordable | Public | Yes | 1.00 | Yes | Yes | 1.00 |
| Indonesia | 7.22 | Private | Yes | 19.81 | Unaffordable | Private & Public | Yes | 9.92 | Unaffordable | Unavailable | Unavailable |
| Iran | 20.44 | Private | Yes | 1.51 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 1.51 |
| Iraq | 9.43 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kenya | 5.25 | Private | Yes | 6.38 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kyrgyzstan | 0.88 | Private | Yes | 4.62 | Unaffordable | Public | Yes | 3.58 | Unaffordable | Yes | 4.62 |
| Lesotho | 3.60 | NIA | NIA | NIA | NIA | NGO | Yes | 5.77 | Unaffordable | Yes | 0.00 |
| Libya | 3.59 | Private | Unavailable (4) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malawi | 1.92 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 0.00 | Yes | Yes | 7.28 |
| Malaysia | 12.88 | Private | Yes | 5.75 | Yes | Public | Unavailable (5) | Unavailable | Unavailable | Yes | 5.46 |
| Mali | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mexico | 15.07 | Private | Yes | 9.10 | Yes | Private | Yes | 49.65 | Unaffordable | NIA | NIA |
| Moçambique | 4.80 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 0.08 | Yes | Yes | 0.00 |
| Mongolia | 4.85 | Private & Public | Unavailable | Unavailable | Unavailable | Public | Yes | 9.30 | Unaffordable | Unavailable | Unavailable |
| Nepal | 4.56 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 2.25 | Yes | Unavailable | Unavailable |
| Niger | 2.31 | Private | Yes | 30.68 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Nigeria | 2.77 | Private | Unavailable (6) | Unavailable | Unavailable | Public | Unavailable (6) | Unavailable | Unavailable | Unavailable (6) | Unavailable |
| North Macedonia | 17.37 | Public | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable (7) |
| Pakistan | 4.23 | Public | Yes | 0.00 | Yes | Public | Yes | 1.98 | Yes | Yes | 0.45 |
| Peru | 9.90 | Private | Yes | 5.96 | Yes | Public | Yes | 1.01 | Yes | Yes | 2.51 |
| Romania | 20.32 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 3.26 | Yes | Unavailable | Unavailable |
| Rwanda | 0.09 | Private | Unavailable (8) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Senegal | 3.34 | Private | Yes | 11.94 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Serbia | 16.35 | Private | Yes | 0.00 | Yes | Public | Yes | 3.16 | Yes | Yes | 0.00 |
| Somalia | 0.10 | Private | Unavailable | Unavailable | Unavailable | Private | Yes | 7.20 | Unaffordable | NIA | NIA |
| South Africa | 9.37 | Private | Yes | 2.16 | Yes | Public | Yes | 2.28 | Yes | Yes | 2.41 |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South Sudan | 5.05 | Private | Yes | 3.00 | Yes | NIA | NIA | NIA | NIA | NIA | NIA |
| Sri Lanka | 1.35 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Yes | 0.57 |
| Sudan | 0.03 | Private | Yes | 5.00 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Syria | 0.55 | Private | Yes | 0.54 | Yes | Public | Yes | 0.00 | Yes | Yes | 0.46 |
| Tanzania | 2.18 | Private | Yes | 5.40 | Unaffordable | Public | Yes | 5.00 | Unaffordable | Yes | 3.40 |
| Thailand | 9.05 | Public | Unavailable | Unavailable | Unavailable | Public | Yes | 1.40 | Yes | NIA | NIA |
| The Gambia | 0.91 | Private | Yes | 14.56 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Timor Leste | 4.43 | NIA | NIA | NIA | NIA | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Tunisia | 4.74 | Public | Yes | 2.08 | Yes | Public | Yes | 0.00 | Yes | Yes | 0.00 |
| Turkiye | 13.90 | Private | Yes | 3.52 | Yes | Private | Yes | 3.52 | Yes | Yes | 0.69 |
| Uganda | 0.07 | Private | Unavailable | Unavailable | Unavailable | NGO | Yes | 6.00 | Unaffordable | Unavailable | Unavailable |
| Venezuela | 0.94 | Private | Yes | 5.34 | Unaffordable | Private | Yes | 9.34 | Unaffordable | NIA | NIA |
| Viet Nam | 6.00 | Private | Unavailable (9) | Unavailable | Unavailable | Public | Unavailable (9) | Unavailable | Unavailable | Unavailable | Unavailable |
| Yemen | 3.23 | Public | Unavailable | Unavailable | Unavailable | Private | Yes | 0.00 | Yes | NIA | NIA |
| Zambia | 2.59 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Zimbabwe | 11.58 | Private | Yes | 18.90 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 15.12 |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 6: Availability, cost, and affordability of ICS-LABA (200+6mcg/dose) by country and type of facility.

Cost is for standardised dose and formulation (inhaled budesonide-formoterol or beclomethasone-formoterol combination 200+6 mcg/dose, 120 doses). CMS costs are wholesale costs, unsuitable for affordability calculations. Affordable: one month's treatment costs less than one day's wage of national minimum wage. $: US$; ICS-LABA: inhaled corticosteroid-long-acting beta-agonist combination; HCF: Healthcare facility; CMS: Central medicine stores; NIA: No information available; DRC: Democratic Republic of Congo; NGO: Non-governmental organisation.

| Country | Minimum daily wage ($) | Pharmacy | | | | HCF | | | | CMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type of facility | ICS-LABA (200+6) available? | ICS-LABA (200+6) cost ($) | ICS-LABA (200+6) affordable? | Type of facility | ICS-LABA (200+6) available? | ICS-LABA (200+6) cost ($) | ICS-LABA (200+6) affordable? | ICS-LABA (200+6) available? | ICS-LABA (200+6) cost ($) |
| Albania | 11.09 | Private | Yes | 0.00 | Yes | Public | Yes | 28.18 | Unaffordable | NIA | NIA |
| Algeria | 5.39 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Angola | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Argentina | 15.60 | Private | Yes | 72.80 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 19.60 |
| Bosnia and Herzegovina | 10.89 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 79.40 | Unaffordable | NIA | NIA |
| Brazil | 8.86 | Private | Yes | 26.23 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 0.00 |
| Burkina Faso | 2.13 | Private | Yes | 25.96 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Cameroon | 2.23 | Private | Yes | 19.20 | Unaffordable | Public | Yes | 23.92 | Unaffordable | Unavailable | Unavailable |
| Chad | 3.70 | Unavailable | NIA | NIA | NIA | Unavailable | NIA | NIA | NIA | Unavailable | Unavailable |
| China | 10.62 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| DRC | 3.54 | Private | Yes | 15.00 | Unaffordable | Public | Yes | 16.00 | Unaffordable | Unavailable | Unavailable |
| Ecuador | 15.17 | Private | Yes | 12.56 | Yes | Private | Yes | 16.20 | Unaffordable | Unavailable | Unavailable |
| Egypt | 5.85 | Private | Yes | 5.60 | Yes | Private | Unavailable | Unavailable | Unavailable | Yes | 6.74 |
| Eswatini | 0.92 | Private | Unavailable | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | Unavailable | Unavailable |
| Ethiopia | 0.31 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Ghana | 1.19 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 10.59 | Unaffordable | Yes | 7.86 |
| Guinea | 2.44 | Private | Unavailable | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | Unavailable | Unavailable |
| Honduras | 14.82 | Private | Yes | 60.18 | Unaffordable | Public | Yes | 57.68 | Unaffordable | NIA | NIA |
| India | 2.14 | Private | Yes | 4.22 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Indonesia | 7.22 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 22.40 | Unaffordable | Unavailable | Unavailable |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iran | 20.44 | Private | Yes | 8.40 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 8.40 |
| Iraq | 9.43 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kenya | 5.25 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kyrgyzstan | 0.88 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 20.62 | Unaffordable | Unavailable | Unavailable |
| Lesotho | 3.60 | NIA | NIA | NIA | NIA | NGO | Yes | 11.54 | Unaffordable | Yes | NIA |
| Libya | 3.59 | Private | Yes | 40.37 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malawi | 1.92 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malaysia | 12.88 | Private | Yes | 12.40 | Yes | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mali | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mexico | 15.07 | Private | Yes | 74.25 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Moçambique | 4.80 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mongolia | 4.85 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 22.20 | Unaffordable | Unavailable | Unavailable |
| Nepal | 4.56 | Private | Yes | 8.54 | Unaffordable | Public | Yes | 4.08 | Yes | Unavailable | Unavailable |
| Niger | 2.31 | Private | Yes | 79.72 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Nigeria | 2.77 | Private | Yes | 10.92 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| North Macedonia | 17.37 | Public | Yes | 50.48 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Pakistan | 4.23 | Public | Yes | 0.00 | Yes | Public | Yes | 6.60 | Unaffordable | Unavailable | Unavailable |
| Peru | 9.90 | Private | Yes | 47.72 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Romania | 20.32 | Private | Yes | 27.30 | Unaffordable | Public | Yes | 29.94 | Unaffordable | Unavailable | Unavailable |
| Rwanda | 0.09 | Private | Yes | 22.30 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Senegal | 3.34 | Private | Yes | 25.87 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Serbia | 16.35 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 26.20 | Unaffordable | Unavailable | Unavailable |
| Somalia | 0.10 | Private | Unavailable | Unavailable | Unavailable | Private | Yes | 15.43 | Unaffordable | NIA | NIA |
| South Africa | 9.37 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 7.14 | Yes | Yes | 7.14 |
| South Sudan | 5.05 | Private | Yes | 14.00 | Unaffordable | Unavailable | NIA | NIA | NIA | NIA | NIA |
| Sri Lanka | 1.35 | Private | Yes | 5.70 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Sudan | 0.03 | Private | Yes | 19.20 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Syria | 0.55 | Private | Yes | 1.24 | Unaffordable | Public | Yes | 0.00 | Yes | Yes | 1.05 |
| Tanzania | 2.18 | Private | Yes | 13.20 | Unaffordable | Public | Yes | 12.40 | Unaffordable | Unavailable | Unavailable |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Thailand | 9.05 | Public | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| The Gambia | 0.91 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Timor Leste | 4.43 | Unavailable | NIA | NIA | NIA | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Tunisia | 4.74 | Public | Yes | 24.20 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | NIA |
| Turkiye | 13.90 | Private | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Uganda | 0.07 | Private | Unavailable | Unavailable | Unavailable | NGO | Yes | NIA | NIA | Unavailable | Unavailable |
| Venezuela | 0.94 | Private | Yes | 27.57 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Viet Nam | 6.00 | Private | Yes | 20.80 | Unaffordable | Public | Yes | 22.40 | Unaffordable | Unavailable | Unavailable |
| Yemen | 3.23 | Public | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Zambia | 2.59 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Zimbabwe | 11.58 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |



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*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 7: Availability, cost, and affordability of ICS-LABA (100+6mcg/dose) by country and type of facility.

Cost is for standardised dose and formulation (inhaled budesonide-formoterol or beclomethasone-formoterol combination 100+6 mcg/dose, 120 doses). CMS costs are wholesale costs, unsuitable for affordability calculations. Affordable: one month's treatment costs less than one day's wage of national minimum wage. $: US$; ICS-LABA: inhaled corticosteroid-long-acting beta-agonist combination; HCF: Healthcare facility; CMS: Central medicine stores; NIA: No information available; DRC: Democratic Republic of Congo; NGO: Non-governmental organisation.

(1): salmeterol-fluticasone 50+1500mcg/dose available in pharmacy; (2): salmeterol-fluticasone 25+250 mcg/dose available in HCF; (3): salmeterol-fluticasone 50+500 mcg/dose available in pharmacy; (4): salmeterol-fluticasone 50+500 available in CMS; (5): salmeterol-fluticasone 50+100, 50+250 and 50+500 mcg/dose available in HCF; (6): salmeterol-fluticasone 50+250 mcg/dose available in pharmacy; (7): salmeterol-fluticasone 50+250 mcg/dose available in pharmacy; (8): salmeterol-fluticasone 36+250 mcg/dose available in pharmacy; (9): fluticasone-formoterol 5+125 mcg/dose available in HCF; (10): salmeterol-fluticasone 25+125 mcg/dose available in HCF and CMS; (11): salmeterol-fluticasone 25+50 mcg/dose available in CMS; (12): salmeterol-fluticasone 25+125 mcg/dose available in CMS; (13): salmeterol-fluticasone 50+100 mcg/dose available in pharmacy; (14): salmeterol-fluticasone 25+250 mcg/dose available in HCF and CMS; (15): salmeterol-fluticasone 50+250 mcg/dose available in pharmacy; (16): salmeterol-fluticasone 25+125 mcg/dose available in HCF; (17): salmeterol-fluticasone 25+50, 25+125, 25+250 mcg/dose available in HCF; (18): salmeterol-fluticasone 25+125 mcg/dose available in pharmacy; (19): salmeterol-fluticasone 50+250 mcg/dose available in pharmacy.

| Country | Minimum daily wage ($) | Pharmacy | | | | HCF | | | | CMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type of facility | ICS-LABA (100+6) available? | ICS-LABA (100+6) cost ($) | ICS-LABA (100+6) affordable? | Type of facility | ICS-LABA (100+6) available? | ICS-LABA (100+6) cost ($) | ICS-LABA (100+6) affordable? | ICS-LABA (100+6) available? | ICS-LABA (100+6) cost ($) |
| Albania | 11.09 | Private | Yes | 0.00 | Yes | Public | Yes | 34.34 | Unaffordable | NIA | NIA |
| Algeria | 5.39 | Private | Unavailable (1) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Angola | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Argentina | 15.60 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable (2) | Unavailable | Unavailable | Unavailable | Unavailable |
| Bosnia and Herzegovina | 10.89 | Private | Yes | 44.29 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Brazil | 8.86 | Private | Yes | 22.64 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Burkina Faso | 2.13 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Cameroon | 2.23 | Private | Yes | 19.20 | Unaffordable | Public | Yes | 18.32 | Unaffordable | Unavailable | Unavailable |
| Chad | 3.70 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| China | 10.62 | Private | Unavailable (3) | Unavailable | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable (4) | Unavailable |
| DRC | 3.54 | Private | Yes | 10.00 | Unaffordable | Public | Yes | 10.50 | Unaffordable | Unavailable | Unavailable |
| Ecuador | 15.17 | Private | Yes | 19.00 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Egypt | 5.85 | Private | Yes | 5.60 | Yes | Private | Unavailable (5) | Unavailable | Unavailable | Unavailable | Unavailable |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Eswatini | 0.92 | Private | Unavailable (6) | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| Ethiopia | 0.31 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Ghana | 1.19 | Private | Unavailable (7) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Guinea | 2.44 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| Honduras | 14.82 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| India | 2.14 | Private | Yes | 3.39 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Indonesia | 7.22 | Private | Yes | 19.71 | Unaffordable | Public | Yes | 28.00 | Unaffordable | Yes | 13.31 |
| Iran | 20.44 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Iraq | 9.43 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kenya | 5.25 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kyrgyzstan | 0.88 | Private | Unavailable (8) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Lesotho | 3.60 | NIA | NIA | NIA | NIA | NGO | Yes | 11.54 | Unaffordable | Unavailable | Unavailable |
| Libya | 3.59 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malawi | 1.92 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malaysia | 12.88 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable (9) | Unavailable | Unavailable | Yes | 26.48 |
| Mali | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mexico | 15.07 | Private | Yes | 73.65 | Unaffordable | Private | Yes | 29.00 | Unaffordable | NIA | NIA |
| Moçambique | 4.80 | Private | Yes | 77.06 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mongolia | 4.85 | Private | Yes | 33.60 | Unaffordable | Public | Yes | 22.20 | Unaffordable | Yes | 29.85 |
| Nepal | 4.56 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Niger | 2.31 | Private | Yes | 81.46 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Nigeria | 2.77 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable (10) | Unavailable | Unavailable | Unavailable | Unavailable (10) |
| North Macedonia | 17.37 | Public | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Yes | 57.67 |
| Pakistan | 4.23 | Public | Yes | 0.00 | Yes | Public | Yes | 4.84 | Unaffordable | Unavailable (11) | Unavailable |
| Peru | 9.90 | Private | Yes | 42.12 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Romania | 20.32 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 14.66 | Yes | Unavailable (12) | Unavailable |
| Rwanda | 0.09 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Senegal | 3.34 | Private | Yes | 19.29 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Serbia | 16.35 | Private | Yes | NIA | NIA | Public | Unavailable | Unavailable | Unavailable | Yes | NIA |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Somalia | 0.10 | Private | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| South Africa | 9.37 | Private | Unavailable (13) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| South Sudan | 5.05 | Private | Yes | 42.00 | Unaffordable | Public | NIA | NIA | NIA | NIA | NIA |
| Sri Lanka | 1.35 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable (14) | Unavailable | Unavailable | Unavailable (14) | Unavailable |
| Sudan | 0.03 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Syria | 0.55 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Yes | 0.92 |
| Tanzania | 2.18 | Private | Yes | 12.00 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Thailand | 9.05 | Public | Unavailable (15) | Unavailable | Unavailable | Public | Unavailable (16) | Unavailable | Unavailable | NIA | NIA |
| The Gambia | 0.91 | Private | Yes | 21.84 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Timor Leste | 4.43 | NIA | NIA | NIA | NIA | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Tunisia | 4.74 | Public | Yes | 18.84 | Unaffordable | Public | Unavailable (17) | Unavailable | Unavailable | Yes | NIA |
| Turkiye | 13.90 | Private | Unavailable (18) | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Uganda | 0.07 | Private | Unavailable | Unavailable | Unavailable | NGO | Yes | 13.50 | Unaffordable | Unavailable | Unavailable |
| Venezuela | 0.94 | Private | Yes | 25.92 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Viet Nam | 6.00 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Yemen | 3.23 | Public | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Zambia | 2.59 | Private | Unavailable (19) | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Zimbabwe | 11.58 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Table 8: Availability, cost, and affordability of LAMA by country and type of facility.

Cost is for standardised dose and formulation. Affordable: one month's treatment costs less than one day's wage of national minimum wage. CMS costs are wholesale costs, unsuitable for affordability calculations. Affordable: one month's treatment costs less than one day's wage of national minimum wage. $: US$; LAMA: Long-acting muscarinic antagonist inhaler; HCF: Healthcare facility; CMS: Central medicine stores; No information: NIA available; DRC: Democratic Republic of Congo; NGO: Non-governmental organisation.

(1): Seebri (glycopyrronium) 50 mcg/dose available in pharmacy and HCF; (2): Incruse (umeclidinium) 62.5 mcg/dose available in CMS; (3): Seebri (glycopyrronium) 50 mcg/dose available in HCF and CMS.

| Country | Minimum daily wage (US$) | Pharmacy | | | | HCF | | | | CMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type of facility | LAMA available? | LAMA cost ($) | LAMA affordable? | Type of facility | LAMA available? | LAMA cost ($) | LAMA affordable? | LAMA available? | LAMA cost ($) |
| Albania | 11.09 | Private | Unavailable (1) | Unavailable | Unavailable | Public | Unavailable (1) | Unavailable | Unavailable | NIA | NIA |
| Algeria | 5.39 | Private | Yes | 9.45 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Angola | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Yes | 69.04 |
| Argentina | 15.60 | Private | Yes | 104.97 | Unaffordable | Public | Yes | 63.21 | Unaffordable | Unavailable | Unavailable |
| Bosnia and Herzegovina | 10.89 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Brazil | 8.86 | Private | Yes | 50.97 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Burkina Faso | 2.13 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Cameroon | 2.23 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Chad | 3.70 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| China | 10.62 | Private | Yes | 36.64 | Unaffordable | Public | Yes | 25.98 | Unaffordable | Yes | 25.74 |
| DRC | 3.54 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Ecuador | 15.17 | Private | Yes | 42.37 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Egypt | 5.85 | Private | Yes | 10.24 | Unaffordable | Private | Yes | 20.28 | Unaffordable | Yes | 10.23 |
| Eswatini | 0.92 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| Ethiopia | 0.31 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Ghana | 1.19 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Guinea | 2.44 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | Unavailable | Unavailable |
| Honduras | 14.82 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 82.40 | Unaffordable | NIA | NIA |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| India | 2.14 | Private | Yes | 2.15 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Indonesia | 7.22 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 56.00 | Unaffordable | yes | 36.83 |
| Iran | 20.44 | Private | Yes | 1.00 | Yes | Public | Unavailable | Unavailable | Unavailable | Yes | 1.00 |
| Iraq | 9.43 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kenya | 5.25 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Kyrgyzstan | 0.88 | Private | Unavailable | Unavailable | Unavailable | Public | Yes | 26.04 | Unaffordable | Unavailable | Unavailable |
| Lesotho | 3.60 | NIA | NIA | NIA | NIA | NGO | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Libya | 3.59 | Private | Yes | 39.33 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malawi | 1.92 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Malaysia | 12.88 | Private | Yes | 47.29 | Unaffordable | Public | Yes | 13.83 | Unaffordable | Unavailable | Unavailable |
| Mali | 2.46 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mexico | 15.07 | Private | Yes | 61.15 | Unaffordable | Private | Yes | 46.00 | Unaffordable | NIA | NIA |
| Moçambique | 4.80 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Mongolia | 4.85 | Private & Public | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Nepal | 4.56 | Private | Yes | 3.92 | Yes | Public | Yes | 3.56 | Yes | Unavailable | Unavailable |
| Niger | 2.31 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Nigeria | 2.77 | Private | Yes | 133.20 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| North Macedonia | 17.37 | Public | Yes | 30.53 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Yes | 30.62 |
| Pakistan | 4.23 | Public | Yes | 0.00 | Yes | Public | Yes | 5.28 | Unaffordable | Unavailable (2) | Unavailable |
| Peru | 9.90 | Private | Yes | 137.20 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Romania | 20.32 | Private | Yes | 27.88 | Unaffordable | Public | Yes | 29.81 | Unaffordable | Yes | NIA |
| Rwanda | 0.09 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Senegal | 3.34 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Serbia | 16.35 | Private | Yes | NIA | NIA | Public | Unavailable | Unavailable | Unavailable | Yes | NIA |
| Somalia | 0.10 | Private | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| South Africa | 9.37 | Private | Yes | 39.52 | Unaffordable | Public | Unavailable (3) | Unavailable | Unavailable | Unavailable (3) | Unavailable |
| South Sudan | 5.05 | Private | Unavailable | Unavailable | Unavailable | NIA | NIA | NIA | NIA | NIA | NIA |
| Sri Lanka | 1.35 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Yes | 0.92 |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sudan | 0.03 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Syria | 0.55 | Private | Yes | 0.78 | Unaffordable | Public | Yes | 0 | Yes | Yes | 0.66 |
| Tanzania | 2.18 | Private | Yes | 14.00 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Thailand | 9.05 | Public | Unavailable | Unavailable | Unavailable | Public | Yes | 15.82 | Unaffordable | NIA | NIA |
| The Gambia | 0.91 | Private | Yes | 83.72 | Unaffordable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Timor Leste | 4.43 | NIA | NIA | NIA | NIA | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Tunisia | 4.74 | Public | Yes | 22.12 | Unaffordable | Public | Yes | 22.12 | Unaffordable | Yes | NIA |
| Turkiye | 13.90 | Private | Yes | 14.24 | Unaffordable | Private | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Uganda | 0.07 | Private | Unavailable | Unavailable | Unavailable | NGO | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Venezuela | 0.94 | Private | Unavailable | Unavailable | Unavailable | Private | Unavailable | Unavailable | Unavailable | NIA | NIA |
| Viet Nam | 6.00 | Private | Yes | 32.00 | Unaffordable | Public | Yes | 33.60 | Unaffordable | Unavailable | Unavailable |
| Yemen | 3.23 | Public | Yes | 0.05 | Yes | Private | Yes | 28.77 | Unaffordable | NIA | NIA |
| Zambia | 2.59 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |
| Zimbabwe | 11.58 | Private | Unavailable | Unavailable | Unavailable | Public | Unavailable | Unavailable | Unavailable | Unavailable | Unavailable |



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*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

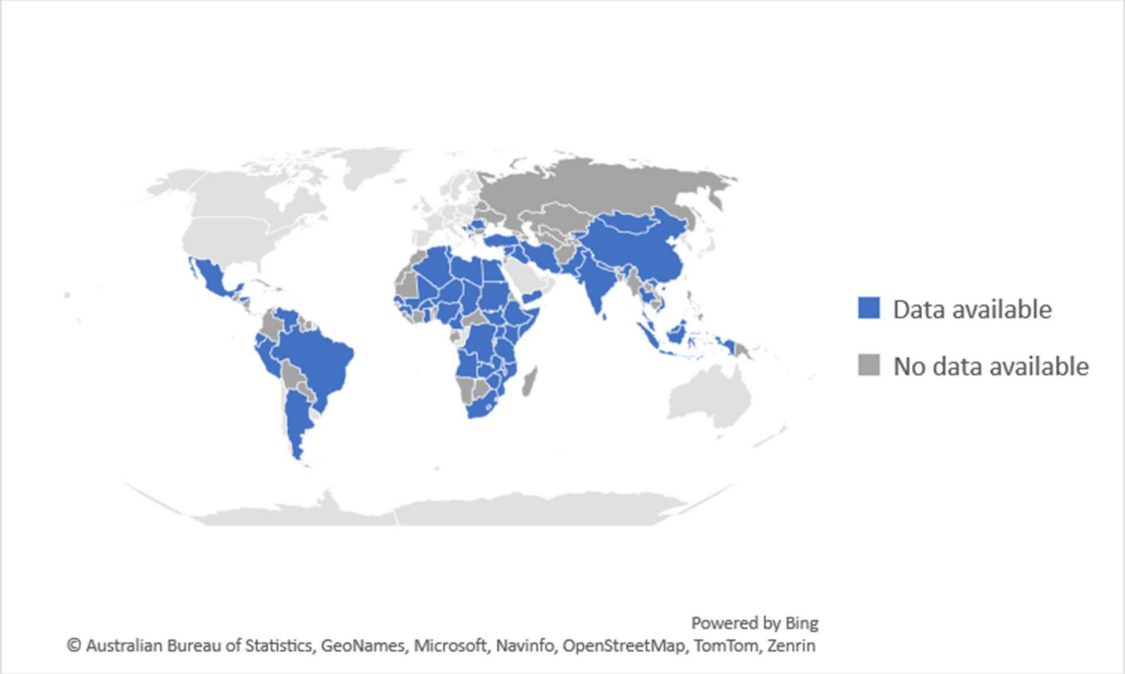
## Supplementary Table 9: Availability and cost for one month's treatment for other essential medicines

Cost is for standardised dose and formulation. Insufficient data for calculations for prednisolone solution, SABA nebuliser, SABA injection. SAMA: Short-acting muscarinic inhaler; SABA: short-acting beta-agonist; IQR: inter-quartile range. *Oral prednisolone price is for a course of 40mg once a day for 5 days.

| | | Medicine | | | | |
|---|---|---|---|---|---|---|
| **Facility** | | **SAMA** | **5mg prednisolone tablets*** | **5mg/ml prednisolone solution** | **5mg/ml SABA nebuliser** | **SABA injection** |
| **Pharmacy** | **Availability** | 19/57 (33 %) | 47/57 (82%) | 3/57 (5%) | 15/57 (26%) | 5/57 (9%) |
| | **Median cost (US$)** | 11.16 | 1.65 | | | |
| | **IQR (US$)** | 5.44-10.08 | 0.60-3.29 | | | |
| | **Range (US$)** | 0-65.90 | 0.00-8.91 | | | |
| **HCF** | **Availability** | 19/56 (34%) | 40/56 (71%) | 2/56 (4%) | 19/56 (34%) | 5/56 (9%) |
| | **Median cost (US$)** | 9.46 | 0.02 | | | |
| | **IQR (US$)** | 2.26-7.30 | 0.01-0.08 | | | |
| | **Range (US$)** | 0-71.40 | 0-1.00 | | | |
| **CMS** | **Availability** | 12/46 (26%) | 35/46 (76%) | 2/46 (4%) | 4/46 (9%) | 9/46 (20%) |
| | **Median cost (US$)** | 2.31 | 0.02 | | | |
| | **IQR (US$)** | 1.67-2.65 | 0.01-0.03 | | | |
| | **Range (US$)** | 0-8.34 | 0-0.58 | | | |

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

**Supplementary Figure 1: World map of LMICs where medicine data was available**

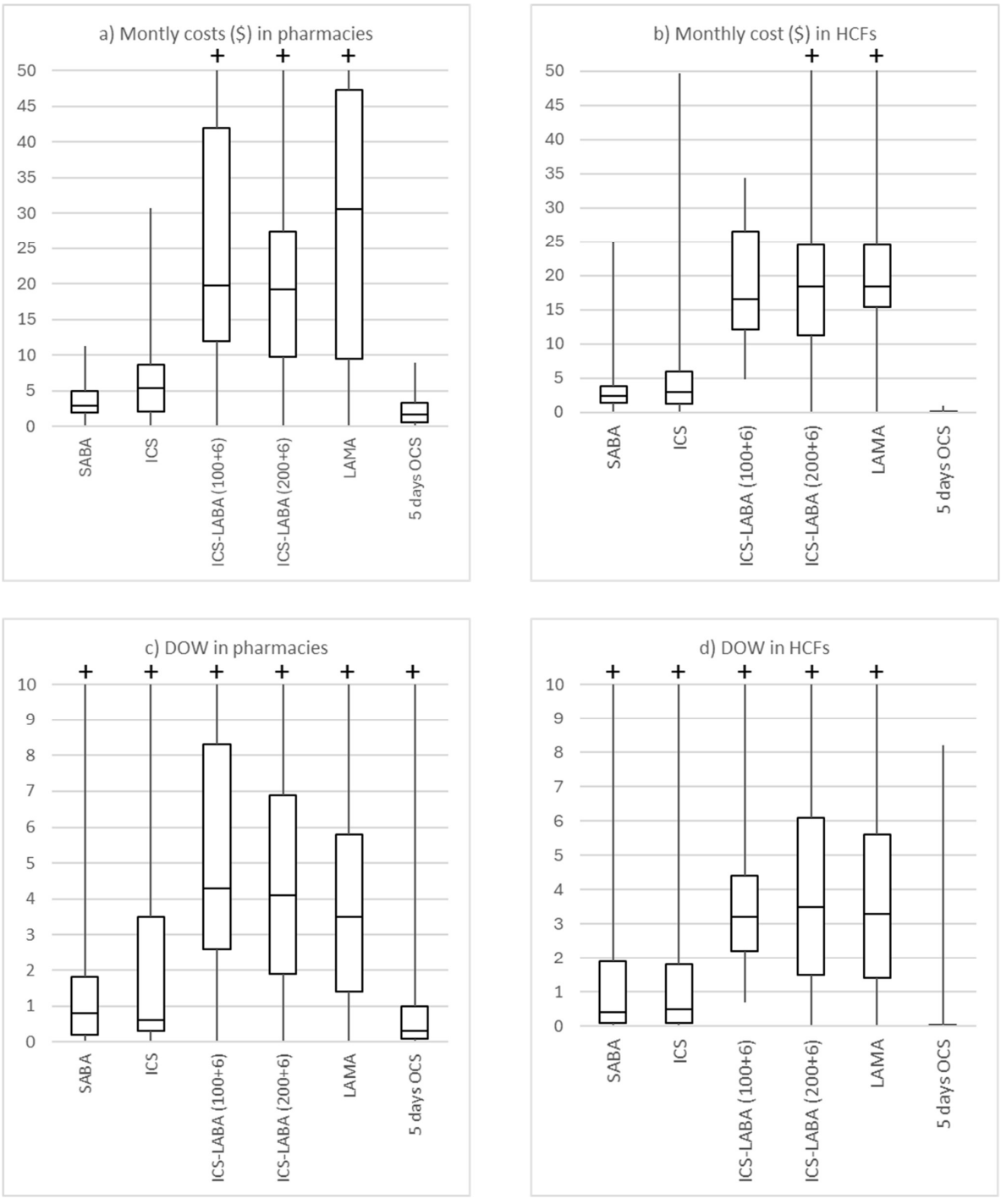


*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

**Supplementary Figure 2: Box and whisker plots for ranges, interquartile ranges and medians of median 1) costs for one month's treatment in US$ in pharmacies and HCFs (a, b) and 2) days of work (DOW) for one month's treatment in pharmacies and HCFs (c, d).**

"+": upper range outside of axis range; maximum range panel a) ICS-LABA (100+6) $81.46, ICS-LABA (200+6) $79.72, LAMA $37.20; b) ICS-LABA (200+6) $79.40, LAMA $82.40; c) SABA 73.4 DOW, ICS 152.8 DOW, ICS-LABA (100+6) 35.2 DOW, ICS-LABA (200+6) 586.8 DOW, LAMA 91.9 DOW, 5 days OCS 48.9 DOW; d) SABA 43.3 DOW, ICS 86.7 DOW, ICS-LABA (100+6) 194.9 DOW, ICS-LABA (200+6) 154.3 DOW, LAMA 29.6 DOW. Cost for OCS is 5 days course of oral prednisolone, 40mg once a day using 5mg tablets. SABA: Short-acting beta-agonist inhaler; ICS: Inhaled corticosteroid; ICS-LABA: inhaled corticosteroid-long-acting beta-agonist (formoterol) combination; LAMA: Long-acting muscarinic antagonist inhaler; HCF: Healthcare facility; CMS: Central medicine stores; DOW: days of work required to pay for one month's treatment; OCS: oral corticosteroids.

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*



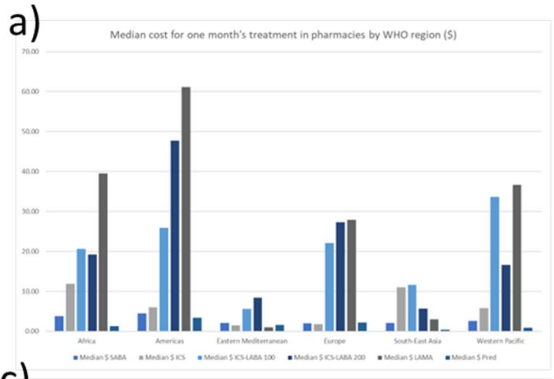
*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Figure 3: Median costs for one month's treatment in US$ or days of work for one month's treatment by WHO region and World Bank Income Group, in pharmacies (a-d) and HCF (e-h).

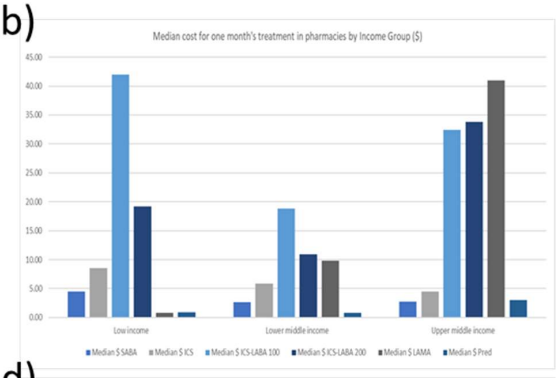
Cost for OCS is 5 days course of oral prednisolone, 40mg once a day using 5mg tablets. SABA: Short-acting beta-agonist inhaler; ICS: Inhaled corticosteroid; ICS-LABA: inhaled corticosteroid-long-acting beta-agonist (formoterol) combination; LAMA: Long-acting muscarinic antagonist inhaler; HCF: Healthcare facility; CMS: Central medicine stores; DOW: days of work required to pay for one month's treatment; OCS: oral corticosteroids.

*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

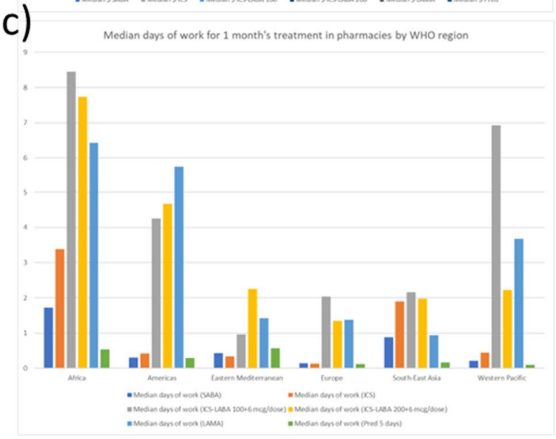
a)



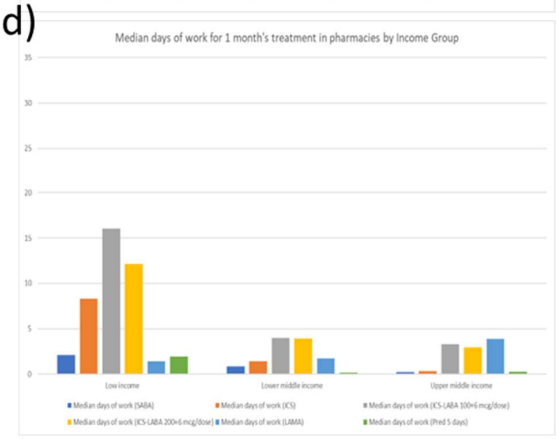

b)



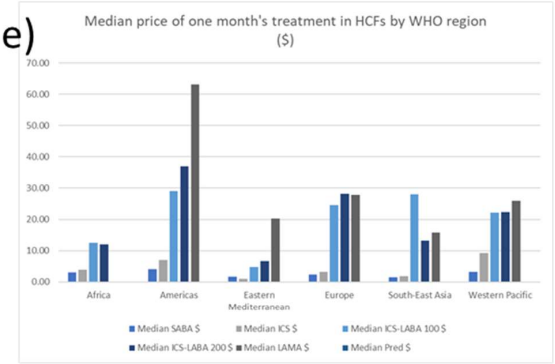

c)



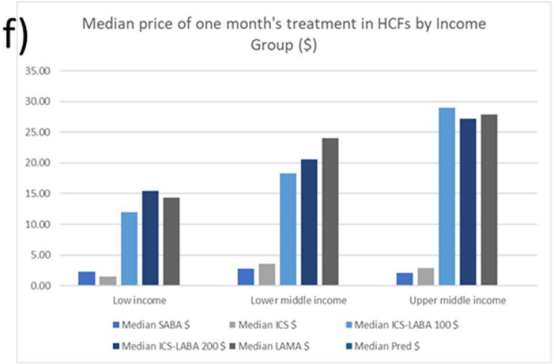

d)



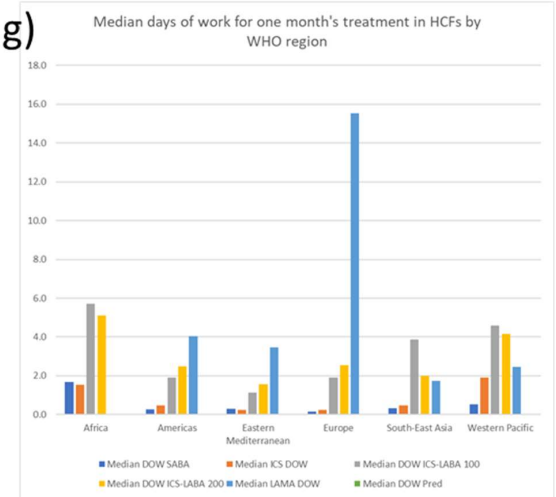

e)



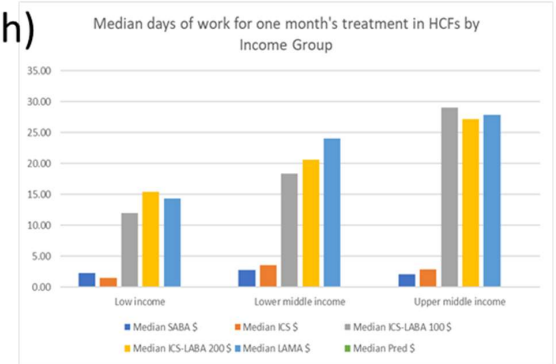

f)




g)



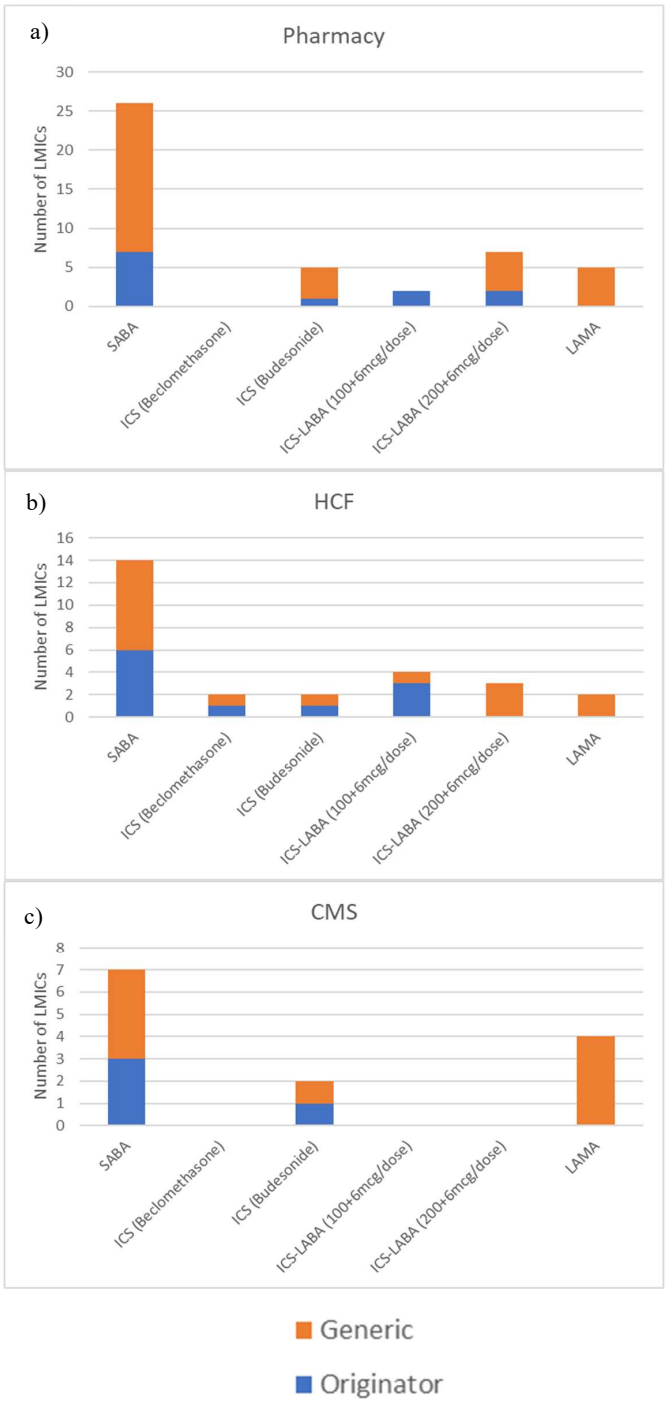

h)



*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

## Supplementary Figure 4: Comparison of originator and generic medicine costs

Figure shows whether generic or originator is cheaper in a) pharmacy, b) HCF, c) CMS. Number of LMICs where generic and originators of given drug class were available.



*Appendix – Availability, cost, and affordability of essential medicines for chronic respiratory diseases in low- and middle-income countries: a cross-sectional study – Stolbrink et al.*

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