

**The cost of health services
delivered at primary care
facilities in the
United Arab
Emirates**



UNITED ARAB EMIRATES
MINISTRY OF HEALTH & PREVENTION

مجلس الصحة
لدول مجلس التعاون
Gulf Health Council



UN INTERAGENCY
TASK FORCE ON NCDs



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Organization





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Executive summary

Scope of the Study:

Strong primary healthcare (PHC) is the key to more efficient health systems with lower health spending and better health outcomes.

This report determines the cost of selected clinical services provided at the primary care level in the United Arab Emirates (UAE) to further promote preventative and close-to-client services in the country. The cost of a total of 84 public sector primary level clinical outpatient services was estimated based on costs of the health workforce as well as drugs and supplies. Importantly, additional PHC provisions, such as systemic PHC resources (e.g., infrastructure or policy development), multisectoral policies and health prevention, as well as PHC delivered by the private sector, were not costed in this study. Note that the costs of selected primary care services modelled in this study are not directly comparable to health expenditure.

This report also highlights the role PHC can play in addressing the growing non-communicable disease (NCD) burden experienced across the region. In 2019, NCDs accounted for 77 percent of the total disease burden in the UAE. Primary health care services support screening, prevention and treatment for NCDs and can achieve better health outcomes with lower health spending for NCD management. Finally, this study provides recommendations to improve future resource allocations for public PHC to meet evolving population health needs.

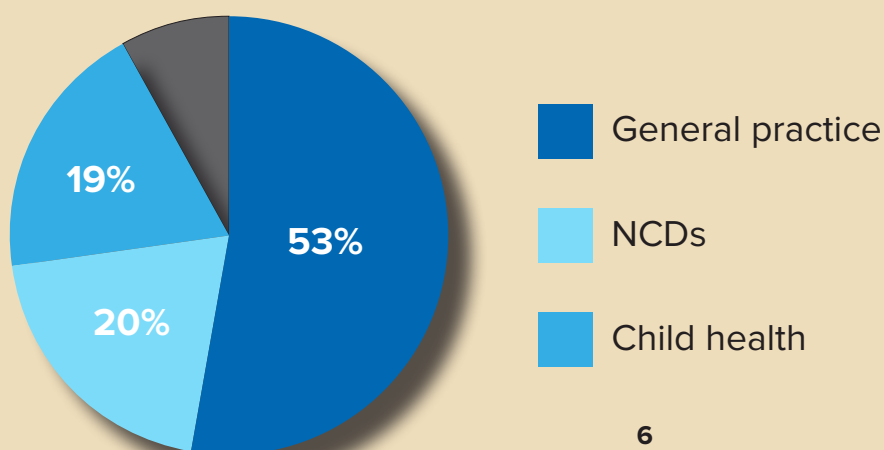
Cost of primary health clinical services

Primary care clinical services cost the UAE

US\$1.2 billion

in 2019. This is equivalent to US\$121 per capita.

Main drivers for primary care clinical service costs





Key findings from the analysis of a set of clinical services provided at the primary care level in UAE:

- **The total cost for the set of clinical services provided at the primary care level in UAE in 2019 was US\$ 1.2 billion.** This is equivalent to US\$121 per capita for the set of clinical services costed.
- **The main drivers for the cost of clinical services were general practice and NCDs.** The programme contributing the most to the total cost was general practice with 52.7 percent of the costs modeled. Non-communicable diseases (NCDs) made up 19.8 percent of the total costs, and this was mainly driven by diabetes, chronic respiratory disease and cardiovascular disease services.
- **While NCD services received the highest spending on a single health area, coverage rates for clinical and screening services could be scaled up.** Indeed, screening services for cancer, risk of cardiovascular disease and diabetes as well as diabetes complications accounted for less than 1 percent of the total costs. Based on current coverage rates, it is estimated that more than 4.9 million people did not receive NCD screening and 1.9 million people did not receive NCD clinical services they needed at the public primary care level in 2019.
- **There is room to strengthen mental health services at a primary care level.** The mental health programme makes up less than 0.3 percent of the total costs, mainly because of low coverage rates. It is estimated that 683,000 people did not receive the mental health services they needed at the public primary care level in 2019.

Recommendations

1

Strengthen NCD clinical and screening services delivered at the primary care level.

2

Shift mental health services from secondary to primary care facilities.

3

Scale-up existing and launch new initiatives to strengthen the national healthcare workforce.

4

Leverage the modelling in this study to further improve primary care efficiencies and health outcomes.



Introduction

The 1978 Alma-Ata Declaration was a landmark event in health history calling for health systems to be orientated towards primary healthcare. In 2018, 40 years later, the Astana Declaration reaffirmed global commitment to PHC as an essential approach to attaining universal health coverage and health-related sustainable development goals. PHC is an approach to healthcare based upon three components: multisector policy and action, empowered people and communities, and primary healthcare as the core of integrated health services within a country.¹ While definitions of PHC vary (see **Box 1**), it generally not only refers to the first point of contact for medical care but also encompasses health education, prevention and promotion.

Efficient PHC has health and economic benefits. A strong PHC system can improve health system efficiency, reduce health costs, increase patient satisfaction and tackle inequalities by improving health outcomes across socio-economic indicators.^{2,3,4} Ultimately, investing in PHC can lead to healthier and more productive populations with an association between PHC and lower mortality rates found across high, middle, and low-income countries.^{5,6}

-
- 1 Operational framework for primary healthcare: transforming vision into action. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2020. Licence: CC BY-NC-SA 3.0 IGO.
 - 2 Organisation for Economic Cooperation and Development (OECD). (2020), Realising the Potential of Primary Healthcare, OECD Health Policy Studies, OECD Publishing, Paris,. Available at: <https://doi.org/10.1787/a92adee4-en>.
 - 3 Starfield B. (1994). Is primary care essential?. *Lancet* (London, England), 344(8930), 1129–1133. Available at: [https://doi.org/10.1016/s0140-6736\(94\)90634-3](https://doi.org/10.1016/s0140-6736(94)90634-3)
 - Starfield, B., Shi, L., & Macinko, J. (2005). Contribution of primary care to health systems and health. *The Milbank quarterly*, 83(3), 457–502. Available at: <https://doi.org/10.1111/j.1468-0009.2005.00409.x>
 - 4 Macinko, J., Starfield, B., & Shi, L. (2003). The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health services research*, 38(3), 831–865. Available at: <https://doi.org/10.1111/1475-6773.00149>
 - 5 Macinko, J., Starfield, B. and Shi, L. (2003). The Contribution of Primary Care Systems to Health Outcomes within Organization for Economic Cooperation and Development (OECD) Countries, 1970–1998. *Health Services Research*, 38: 831-865. Available at: <https://doi.org/10.1111/1475-6773.00149>
 - 6 Macinko, J., Starfield, B., Erinosho, T. (2009). The impact of primary healthcare on population health in low and middle income countries. *Journal of Ambulatory Care Management*, 32:2;150-171.

Box 1. What is Primary Healthcare?

While long established as a concept, the definition of primary healthcare continues to evolve with many definitions existing. Generally speaking, PHC refers to the first, and main, point of contact with the national healthcare system on both an individual and community level. Hallmarks of PHC include:^{7,8,9,10,11}

- universal accessibility
- person- rather than disease-focused
- continuous across the life span
- comprehensive services, including prevention, diagnosis and treatment

In this report, PHC is defined as per the OECD definition:

*“Primary healthcare is expected to be the first and main point of contact for most people with the healthcare system, focussed on the people and their communities. It takes into account the whole person and is patient-focused, as opposed to disease or organ system-focused, and thus recognises not only physical, but also psychological and social dimensions of health and well-being.”*⁷

PHC can improve health system efficiency by reducing hospitalization rates and emergency department visits, thereby reducing healthcare costs.¹² This has been seen in countries where a referral from a general practitioner or family practitioner facilitates hospital admission. PHC serves to be the first point of contact between a patient and the health system, thereby allowing the health system to better manage chronic conditions and to perform preventative measures.¹³ With a better understanding of individual patient and whole family risks, both preventative and chronic care can be provided in a patient-centred way. With these considerations, PHC provides for a healthier population and a more efficient, cost-effective health system.

7 OECD (2020), Realising the Potential of Primary Healthcare, OECD Health Policy Studies, OECD Publishing, Paris, <https://doi.org/10.1787/a92adee4-en>.

8 Operational framework for primary healthcare: transforming vision into action. Geneva: World Health Organization and the United Nations Children’s Fund (UNICEF), 2020. Licence: CC BY-NC-SA 3.0 IGO.

9 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly*. 2005;83(3): 457–502.

10 Salah, K. & Kidd, M. (2019). Family Practice in the Eastern Mediterranean Region: Universal health coverage and quality primary care. Taylor & Francis Group, Florida, USA.

11 OECD (2019), Deriving preliminary estimates of primary care spending under the SHA 2011 framework. <https://www.oecd.org/health/health-systems/Preliminary-Estimates-of-Primary-Care-Spending-under-SHA-2011-Framework.pdf>

12 OECD (2020), Realising the Potential of Primary Healthcare, OECD Health Policy Studies, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/a92adee4-en>.

13 OECD (2020), Realising the Potential of Primary Healthcare, OECD Health Policy Studies, OECD Publishing, Paris,. Available at: <https://doi.org/10.1787/a92adee4-en>.



Box 2. Characteristics of strong primary health care^{14, 15}

- Comprehensive and continuous care accessible to all
- Education and training provided mostly within primary care
- Individual healthcare provider associated with each patient or family
- Efficient referral systems to secondary and tertiary care
- System is targeted to the needs of the local population

Globally there is a renewed commitment to PHC in light of changing population and health characteristics. Aging populations, population growth, increasing health literacy and public expectations of health services are increasing demand for healthcare globally and in the Eastern Mediterranean Region (EMR).¹⁶ Changing disease burdens toward non-communicable diseases and increasing access to technology among the general population are further driving changes in PHC. Estimates regarding PHC note that 90 percent of all health needs can be met at the PHC level, giving countries a clear path forward in improving health and health system efficiency.¹⁷

There is a long history of primary healthcare in the Eastern Mediterranean, with the Qatar Declaration on Primary Healthcare endorsed by all regional countries in 2008.¹⁸ The declaration stands for Member State commitment to achieve better health and wellness through strengthening PHC-based health systems. The region is seeing a growing commitment to family practice (FP) as a way to improve primary healthcare, and ultimately universal health coverage. PHC can be delivered by through general practice and family practice, with the two terms used interchangeably in many circumstances. For the purpose of this report, general practice (GP) will be considered as services delivered by a physician who is qualified to deliver primary healthcare to an individual, their family and their community through general practice medical training. Family practice will refer to services delivered by a family physician who has undergone specialty training to care for the overall health of families and individuals across their lifespan.¹⁹

14 World Health Organization. (2008). The world health report 2008: primary healthcare now more than ever. World Health Organization. Available at: <https://apps.who.int/iris/handle/10665/43949>

15 van Weel, C., & Kidd, M. R. (2018). Why strengthening primary healthcare is essential to achieving universal health coverage. CMAJ: Canadian Medical Association journal = journal de l'Association medicale canadienne, 190(15), E463–E466. Available at: <https://doi.org/10.1503/cmaj.170784>

16 Salah, H. et Kidd, M. (Ed.) (2019): Family Practice in the Eastern Mediterranean Region. CRC Press. Available at: <https://applications.emro.who.int/docs/9781138498587-eng.pdf>

17 World Health Organization, Regional Committee for the Eastern Mediterranean. (2009). Progress report on strengthening primary health care based health systems. https://applications.emro.who.int/docs/EM_RC56_INF_DOC_4_en.pdf

18 World Health Organization, Regional Committee for the Eastern Mediterranean. (2009). Progress report on strengthening primary health care based health systems. https://applications.emro.who.int/docs/EM_RC56_INF_DOC_4_en.pdf

19 Salah, H. et Kidd, M. (Ed.) (2019): Family Practice in the Eastern Mediterranean Region. CRC Press. Available at: <https://applications.emro.who.int/docs/9781138498587-eng.pdf>



An example of this would be one family physician, or team, providing comprehensive PHC to all members of a family unit. Family practice therefore delivers the key elements of PHC and will be considered the basis of PHC for this report.

Realising the highest possible rate of universal health coverage is essential to achieving the health-related Sustainable Development Goals. As primary healthcare is the cornerstone of comprehensive health coverage, evidence-based planning is critical to ensuring the continuity of primary healthcare programmes. To support increased investments in PHC programmes and to facilitate progress towards achieving universal health coverage, the United Nations has been invited to assist GCC countries of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE, in undertaking a comparative study on the costs of PHC programmes. Knowing the cost of PHC components and having estimates of programme costs for the coming years will help countries find practical financing and allocative solutions to help direct investments to areas that reduce costs such as the medicine industry, medical supplies and training of health personnel according to country needs. This will also enhance the continuity of health services in GCC countries regarding both efficiency and quality to meet increasing demand.

AIM OF THE STUDY

This study aims to estimate the costs of delivering a set of primary care clinical services spread across seven programmes: (1) immunisation, (2) non-communicable diseases, (3) oral and dental care, (4) child health, (5) nutrition, (6) mental health, reproductive, maternal, neonatal and child health, and (7) general practice. The study will use this set of clinical services delivered at the primary care level to represent PHC. However, this set does not include all services, or all costs, associated with PHC.

SCOPE OF THE STUDY

The scope of this study is focused on costing preventive care and general outpatient care (healthcare providers, medicines, diagnostic tests, and supplies) as essential components of PHC in promoting preventive and close-to-client services. The analysis focuses on a set of outpatient clinical services delivered at the PHC level. The clinical services were determined in consultation with experts from the Ministry of Health and Prevention. The list created does not constitute an exhaustive set of PHC services. The cost of other PHC measures such as multisectoral policies and actions and empowered people and communities were not estimated. In addition, the share of the required resources for information systems, good governance and financing were not estimated. Additionally, only costs incurred by the public sector in the UAE were estimated. The coverage rates might not reflect the number of services delivered in the private sector (**Figure 1**).



Figure 1: Primary Healthcare service costs modelled in this study





Methods

SELECTION OF CLINICAL SERVICES

A list of clinical services was established based on information available in OneHealth Tool. This choice was justified by the availability of standard regimen treatments, prices and time estimates in the OneHealth Tool Costing Module. The original list was modified by FPs in each country to reflect the range of services delivered at the primary care level.

COSTS AND HEALTH EXPENDITURES

This study estimates the costs of providing a set of clinical services delivered at primary healthcare facilities. We defined total costs as the direct costs (drugs, procedures, supplies, and healthcare providers' time) spent to deliver a particular service. This definition differs from the broader notion of health expenditures, which encompasses all expenditures incurred to provide health services (infrastructure and equipment, governance, etc.). For example, while health expenditures generally include the total cost of the health workforce, this study valorised only the time spent by healthcare providers on delivering the selected clinical services. Therefore, the costing analysis did not include the time spent by healthcare providers on other clinical services or non-clinical activities (coordination, training, etc.). The costs estimated in this study only reflect the fraction of the primary healthcare expenditures directly employed to deliver the selected clinical services. Furthermore, the study was conducted using standard costs developed based on standard treatment regimens and price estimates (WHO-CHOICE, WHO, UNICEF). Using standard costs provides an estimate of the expected costs of clinical services. It may differ from the actual costs, which refer to what was actually spent to deliver these selected services.

CALCULATION OF INTERVENTION COSTS AND NUMBER OF SERVICES

We used an ingredient costing method to estimate the costs of delivering a selected list of clinical services. In this approach, the cost of clinical service is considered the product of the number of clinical services delivered and the cost per service:

$$\text{Intervention cost} = \text{Number of services} \times \text{Cost per service}$$

The number of services delivered was obtained from annual statistical reports published by the Ministries of Health or were directly provided by FPs. When the number of services delivered was unavailable or expressed as a coverage rate, we estimated it as follows:

$$\text{Number of services} = \text{Target population} \times \text{Population in need} \times \text{Coverage rate}$$



To estimate the cost of service the following formula was used:

$$\text{Cost per service} = \text{Drugs and supply costs} + \text{Healthcare provider time cost}$$

We used treatment, costing, and time staff requirements assumptions from the OneHealth Tool Costing Module. These country-specific assumptions were developed based on standard WHO protocols, expert opinions, and international drug prices (WHO, WHO-CHOICE, UNICEF, MSH International Drug Price Indicator). In addition, we developed specific assumptions for all services not included in the OneHealth Tool Costing Module (see **Annex 1**).

The different components used in the model (target population, population in need, coverage rate, drug and supply cost, and healthcare providers' time cost) are presented below.

TARGET POPULATION

The target population refers to the sub-population eligible for a specific clinical service (i.e., pregnant women, adolescents, total population). When the target population was related to an age group (i.e., children 0-59 months, adults 18+, women 15-49), we defined it from the population census or estimates provided by the Ministry of Health. When it was related to a specific condition, disease or status (i.e., people with diabetes, people with asthma, pregnant women), the target population was estimated from national surveys, statistical reports, international databases or academic literature.

POPULATION IN NEED

The population in need refers to the share of the target population, which requires a specific service per year (see **Annex 1**). It was determined by the incidence or the prevalence of a disease and/or treatment assumptions (e.g. 60 percent of people with diabetes should receive standard glycemic control; 50 percent of women aged 40-70 should receive clinical breast examination every year).

COVERAGE RATE

The coverage rate reflects the percentage of the population in need who received a service at the primary healthcare level. The coverage rate was calculated following three steps:

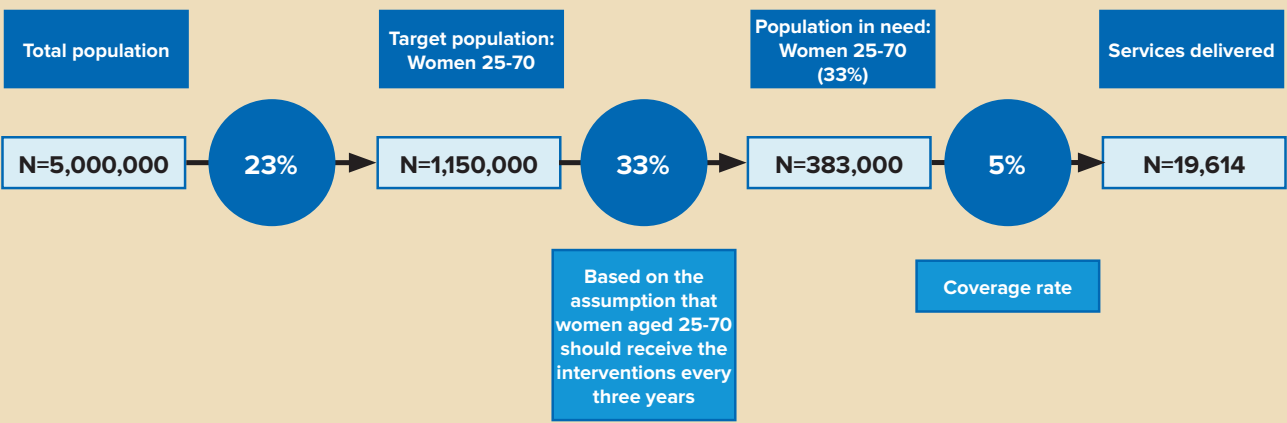
1. We estimated the population in need using prevalence rates, incidence rates or OneHealth Tool treatment assumptions.
2. We determined the number of services delivered in 2019. In the absence of relevant country-specific findings, we developed assumptions based on OHT by-default coverage rates, data from nearby countries or the scientific literature (see **Annex 3**).
3. We divided the number of services delivered by the population in need to obtain the coverage rate.



It is important to note that the coverage rate does not consider the percentage of people who could have received a specific service outside the public primary healthcare level.

The links between the target population, the population in need, the coverage rate, and the number of services delivered are described below (**Figure 2**).

Figure 2: Cost calculation example: Pap smear intervention for women aged 25 to 70



DRUGS AND SUPPLY COSTS

Country-specific estimates extracted from the OneHealth Tool Costing Module were used as a primary reference to determine the unit drugs, vaccines, and supply costs. Assumptions were developed when no estimate was available in OneHealth Tool (see **Annex 1**).



HEALTH PROVIDERS' TIME COSTS

To estimate the cost of health providers' time per service the following formula was used:

$$\text{Healthcare provider's cost} = \text{Salary per minute} \times \text{Minutes required to deliver the service}$$

The health providers' time costs refer to the time spent by healthcare providers (nurses, general practitioners, specialist doctors, midwives, etc.) for delivering one service, expressed in monetary value. These costs were estimated in two stages. First, we determined the cost of one minute spent by each category of healthcare providers based on their average annual salaries and assumptions on the number of working days per year (217 days) and working hours per day (8 hours). Then, we multiplied the number of minutes spent by health providers for each service by the associated cost per minute. The time spent by the healthcare providers was extracted from the OneHealth Tool or estimated by the research team when data was unavailable (see Annex 1).

ASSUMPTIONS AND LIMITATIONS

This analysis had limitations that must be mentioned. The list of clinical services costed does not include all services delivered at the primary care level. The analysis did not estimate health system costs or costs related to other PHC measures. No primary data collection was performed to estimate the drugs and supply costs for each clinical service. Instead, the available information in the OneHealth Tool was used.

Data on intervention coverages were not always available. For interventions without available coverage rates, assumptions were made based on similar interventions or data from nearby countries. When possible, we used the official number of visits related to a programme (i.e. NCDs) or a type of intervention (i.e. diabetes clinics, antenatal care) to estimate services-specific coverage rates and triangulate the results. Coverage rates are particularly uncertain for screening and awareness-related activities since they are not always captured in surveys or health statistics records. Different triangulations and validation methods were used to account for uncertainty, such as consultations with local technical teams, comparing figures with other countries in the region, comparing figures with other similar services, etc. Generally, the coverage rates must be interpreted with caution as they only reflect the quantity of services delivered at the primary care level. As a result, we can assume that some services are also delivered at other levels of the public health system and/or in the private sector. The share of services delivered in the private sector is likely to vary depending on the country's healthcare system and the population structure.

There was no available information about the overhead costs necessary for running the clinical services at primary care level (i.e. training, programme management, supervision, monitoring and evaluation, communication, infrastructure and equipment, transportation, and advocacy). Therefore, an estimation of 20 percent of the total costs was used to account for this.

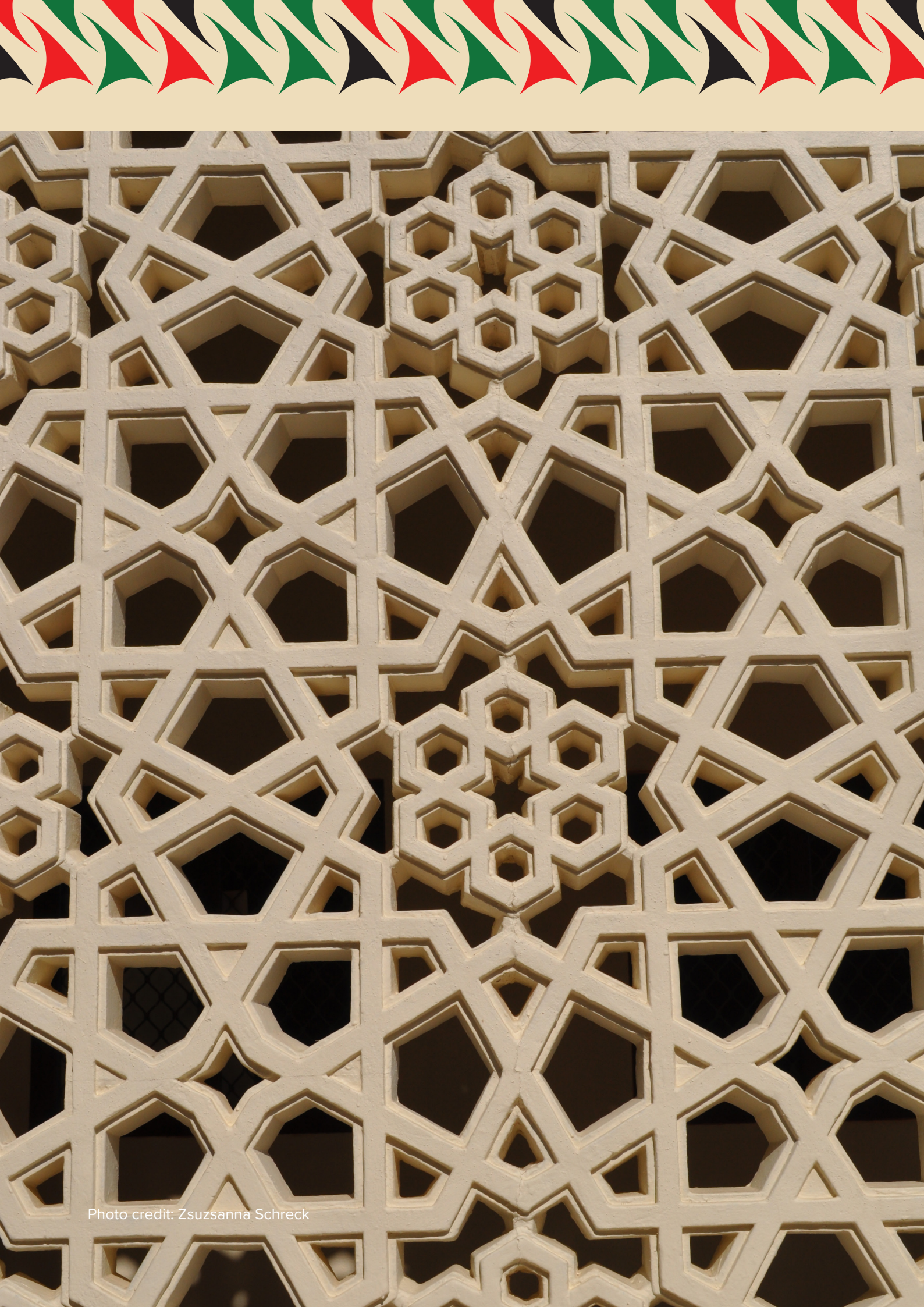


Photo credit: Zsuzsanna Schreck



Primary healthcare in the UAE

PRIMARY HEALTHCARE GOVERNANCE

Healthcare in the UAE is split into private and public sectors. Public healthcare is regulated on both the federal and emirate level. On the federate level, the Ministry of Health and Prevention provides regulatory oversight, licenses and sets the price of medical services and medicines, and organizes training programmes for all emirates, while also providing and funding healthcare services in the northern emirates. Across the southern emirates, healthcare is provided by local government entities including the Department of Health Abu Dhabi, the Abu Dhabi Health Services Company (SEHA) and the Dubai Health Authority (DHA).²⁰ The private health sector plays a prominent role in the UAE, covering around 67 percent of all hospitals and nearly 64 percent of all physicians in the country in 2017.²¹

Population growth, shift in the disease burden to NCDs and medical tourism have seen the demand for health services increase substantially in the UAE. While the healthcare sector has expanded considerably in recent decades, healthcare facilities are struggling to keep up with demand. To address these challenges and improve the health system, the UAE have developed both federal and regional strategies. For example, achieving world-class healthcare was a central goal to UAE's Vision 2021, which in alignment with the Sustainable Development Goals (SDGs) aimed to increase the number of nurses and to reduce the prevalence of NCDs and NCD risk factors including smoking, diabetes and cardiovascular diseases.

To support the aims of the Vision 2021, several multisectoral plans were developed for key disease areas in 2017, including the National Nutrition Plan, Childhood Obesity Framework, National NCD Plan and National Maternal and Child Health Plan.²² On a regional level, both Abu Dhabi and Dubai have their own strategic healthcare plans. Abu Dhabi's 2014 Strategic Healthcare Plan aimed to attract and retain medical professionals, expand healthcare services and strengthen health IT infrastructure.²³ Dubai's strategies had a stronger focus on improving primary care and disease prevention. Indeed, the DHA's 2013 12-year plan aimed to establish 40 new primary care centres and three new hospitals, and the Dubai Health Strategy 2016-2021 had a strong focus on prevention, early detection and high-quality care for NCDs.²⁴

20 US-UAE Business Council (2021): Sector Updates - The UAE Healthcare Sector. Available at: <http://usuaebusiness.org/wp-content/uploads/2019/01/2021-U.A.E.-Healthcare-Report.pdf>

21 United Arab Emirates, "Healthcare providers - The Official Portal of the UAE Government," The Official Portal of the UAE Government, Sep. 2020

22 United Arab Emirates (2010): Vision 2021. Available at: <https://www.ohchr.org/sites/default/files/lib-docs/HRBodies/UPR/Documents/Session15/AE/UAEVision2021.pdf>

23 Department of Health Abu Dhabi (2014): Abu Dhabi Strategic Healthcare Plan. Available at: <https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/local-governments-strategies-and-plans/abu-dhabi-healthcare-strategic-plan>

24 Government of Dubai et Dubai Health Authority (2017): Dubai Health Strategy 2016-2021. Available at: https://www.dha.gov.ae/ar/uploads/062022/Dubai_Health_Strategy_2016-2021_En2022649600.pdf



PRIMARY HEALTHCARE SERVICES

Healthcare is delivered at a primary, secondary and tertiary level. Public primary care is delivered through 131 governmental PHC facilities following the concept of family medicine as a provision of lifelong comprehensive healthcare for families and individuals.²⁵ PHC provides essential medicines and essential health services, including NCD management and control, maternal and child health, community dental services, geriatric services, mental health services and screening programmes.

In line with the coordinated and patient-centred approach to PHC, the UAE are including a wider range of services into primary care. In recognition of the high NCD disease burden for example, the country launched 42 NCD clinics between 2017 and 2018 and trained PHC staff in early detection and management of NCDs.²⁶ Catering to demographic changes, the DHA established an elderly care unit under PHC in 2006. The unit provides acute, sub-acute and long-term care through a multidisciplinary team of dietitians, social workers, physiotherapist, FPs and geriatricians.

PRIMARY HEALTHCARE COVERAGE

Due to growing healthcare costs, the government has introduced compulsory financing arrangements for the entire population. These arrangements differ across the emirates, but all cover a comprehensive scope of services. For example, in Abu Dhabi the government runs the “Thiqa” programme which provides full medical coverage to UAE nationals at a wide network of both public and private facilities.²⁷ In Dubai, aside from publicly funded health protection schemes, the “Saada” programme was introduced to offer insurance for citizens who were not covered by any other scheme.²⁸

The UAE has a population of nearly 10 million, with expatriates accounting for over 88 percent of the population.²⁹ National regulations mandate health insurance coverage for all expatriates and their dependents. In both the emirates of Abu Dhabi and Dubai, employers are required to provide coverage to their employees.³⁰

25 Salah, K. & Kidd, M. (2019). Family Practice in the Eastern Mediterranean Region: Universal health coverage and quality primary care. Taylor & Francis Group, Florida, USA.

26 I. Fadhil, B. Belaila, and H. Razzak, National accountability and response for noncommunicable diseases in the United Arab Emirates. *Int. J. Noncommunicable Dis.*, vol. 4, no. 1, p. 4, 2019, doi: 10.4103/jncd.jncd_55_18.

27 Government of Abu Dhabi, “Thiqa Programme”. Available at: <https://www.thiqa.ae/en>

28 Dubai Health Authority and Government of Dubai, “SAADA Health Insurance”. Available at: <http://saada.ae/index-en.html> Note that the name of this programme changed, updated link here: <https://enayaprogram.ae/index.html>

29 World Bank: https://data.worldbank.org/indicator/SM.POP.TOTL.ZS?locations=AE&most_recent_value_desc=true

30 United Arab Emirates, Health insurance -The Official Portal of the UAE Government. Available at: <https://u.ae/en/information-and-services/health-and-fitness/health-insurance>



PHC is easily accessible throughout the country, with no more than 200 people living more than 30 km away from a PHC facility.³¹ Nonetheless, density of PHC centres is higher in the more populated areas. To improve access to services in rural areas and in particular the emirates of Fujairah and Ras Al Khaimah, the Ministry of Health and Prevention introduced mobile healthcare clinics in 2016. These mobile clinics provide services including dental preventive care, school screenings and periodic health and cancer screening in areas where healthcare facilities are not easily accessible.³²

PRIMARY HEALTHCARE WORKFORCE

UAE's healthcare workforce has been steadily growing. With 50.4 nurses and 25.3 physicians per 10,000 population in 2018, the UAE is still below but slowly approaching the OECD average of 90 nurses and 36 physicians per 10,000.^{33, 34} As of 2018, there were 968 GPs with 382 working in public PHC.

The number of skilled local medical professionals can be increased to strengthen the healthcare workforce. Currently, with 97 percent of all nurses working in the country are expatriates.³⁵ The Government is already taking action to increase the number of local health workers, for example through an initiative launched by the Ministry of Health and Prevention in 2015 which provided scholarships to Emiratis wanting to become nurses.³⁶ For physicians, all six medical colleges in the UAE have family medicine departments, with around 25 FPs graduating every year. This output is insufficient to meet the country's demands for PHC practitioners, highlighting a clear need to expand family medicine departments and attract more medical students to this specialty.³⁷

31 US-UAE Business Council (2021): Sector Updates - The UAE Healthcare Sector. Available at: <http://usuaebusiness.org/wp-content/uploads/2019/01/2021-U.A.E.-Healthcare-Report.pdf>

32 Salah, K. & Kidd, M. (2019). Family Practice in the Eastern Mediterranean Region: Universal health coverage and quality primary care. Taylor & Francis Group, Florida, USA.

33 World Bank. (2022). Data. <https://data.worldbank.org/indicator/SH.MED.PHYS.ZS?locations=AE>

34 OECD (2021): Health at a Glance 2021. OECD Library. Available at: https://www.oecd-ilibrary.org/sites/ae3016b9-en/1/3/8/2/index.html?itemId=/content/publication/ae3016b9-en&csp_=ca413da5d44587bc56446341952c275e&itemIGO=oecd&itemContentType=book

35 US-UAE Business Council (2021): Sector Updates - The UAE Healthcare Sector. Available at: <http://usuaebusiness.org/wp-content/uploads/2019/01/2021-U.A.E.-Healthcare-Report.pdf>

36 Salah, K. & Kidd, M. (2019). Family Practice in the Eastern Mediterranean Region: Universal health coverage and quality primary care. Taylor & Francis Group, Florida, USA.

37 Salah, K. & Kidd, M. (2019). Family Practice in the Eastern Mediterranean Region: Universal health coverage and quality primary care. Taylor & Francis Group, Florida, USA.



MULTISECTORAL PRIMARY HEALTHCARE COORDINATION

The UAE has made strong efforts in advancing multisectoral engagement within the realm of PHC. As such, the Ministry of Health and Prevention is collaborating with other government entities, non-governmental organizations and members of the community in several initiatives to improve the prevention and control of NCDs. For example, in the “Pink Caravan” breast cancer awareness initiative, primary care professionals work with the Friends of Cancer Patients initiative to deliver breast cancer screening to communities. Since its launch in 2011, this initiative has facilitated over 75,000 examinations in seven emirates.³⁸

With up to one in three school children overweight or obese and therefore at higher risk of developing NCDs, high body mass index across UAE youth is a major cause for concern.³⁹ To address this, the Ministry of Health and Prevention is collaborating with the Ministry of Education to improve the nutritional value of school canteen foods and encourage students to become more physically active. Related health indicators in schools are monitored every five years through the UAE Global School-Based Student Health Survey.⁴⁰ Both public and private schools also provide vaccination services to students.

HEALTH BUDGETING

With the rapid expansion of the health system, health expenditure, including for primary care, has increased significantly in the UAE. Indeed, per capita expenditure on healthcare has risen significantly from US\$787 in 2000 to US\$1,843 in 2019.⁴¹ Total health expenditure in the UAE amounts to around 4 percent of the GDP. In 2019, 52 percent of the total health expenditure in the UAE was provided by the government, a decrease from 69 percent in 2000. Private health expenditure as a proportion of total health expenditure has increased to 48 percent in 2019. Out-of-pocket health expenditure as a proportion of total health expenditure has decreased from 22 to 13 percent between 2000 and 2019.⁴² Based on some projections, the expenditure on health could rise to US\$25.7 billion by 2024, thus nearly doubling since 2014.⁴³

Containing costs is a major challenge for the UAE, especially considering that healthcare is more expensive in the UAE than in other countries of the Eastern Mediterranean Region.⁴⁴

38 Friends of Cancer Patients: Pink Caravan. Available at: <https://www.focp.ae/our-programs/womens-health/>

39 Abduelkarem AR, Sharif SI, et al (2020): Obesity and its associated risk factors among school-aged children in Sharjah, UAE. PLoS One 15(6):e0234244. doi: 10.1371/journal.pone.0234244.

40 World Health Organization: NCD Microdata Repository – Global School-Based Student Health Survey 2016. Available at: <https://extranet.who.int/ncdsmicrodata/index.php/catalog/647>

41 World Health Organization: Global Health Expenditure Database - UAE. Available at: <https://apps.who.int/nha/database/ViewData/Indicators/en>

42 World Health Organization: Global Health Expenditure Database - UAE. Available at: <https://apps.who.int/nha/database/ViewData/Indicators/en>

43 World Health Organization, “Global Health Expenditure Database,” WHO Global Health Expenditure Database: UAE.

44 Thomas, B. (2014): Revealed: Doctor fees up to 6 times higher in UAE. In: Arabian Business. Available at: <https://www.arabianbusiness.com/industries/healthcare/revealed-doctor-fees-up-6-times-higher-in-uae-535518#.V2rbIPkrLIU>



To address this challenge, the Ministry of Health and Prevention has asked physicians to prescribe fewer antibiotics in March 2018,⁴⁵ and the emirate of Abu Dhabi began rolling out generic medicine instead of the more costly branded options.⁴⁶

DISEASE BURDEN

Like in many countries, the disease burden in the UAE has shifted over the past 30 years to be predominantly attributed to NCDs. In 1990, 63 percent of the total disease burden in disability-adjusted life-years (DALYs) was caused by NCDs. This has increased rapidly and NCDs now account for 77 percent of DALYs in the UAE (**Figure 3**).⁴⁷ Across this time period, the UAE has had a higher NCD burden than the global and regional averages. In 2019, the remaining disease burden included injuries (18 percent) and communicable, maternal, neonatal and nutritional diseases (6 percent).

Within the high prevalence of NCDs in the UAE, the leading causes of disease are cardiovascular diseases (accounting for 15.6 percent), cancer (accounting for 9.8 percent) and mental health disorders (accounting for 9 percent). When looking at mortality, ischemic heart disease is the leading cause of death in the country, and eight out of the top ten causes of death are NCDs.⁴⁸ NCDs are well suited to treatment in PHC, requiring consistent access to health services with providers who know their patients' histories to achieve the best outcomes.

The UAE is experiencing population aging. Between 2019 and 2100 the majority of the population is expected shift from being aged between 30 and 55 years to being aged 55 to 90 years.⁴⁹ Considering this population change alongside the increasing burden of NCDs provides opportunity to improve population wellbeing through strengthened PHC services.

Alongside the high disease burden from NCDs, there is also a high level of injuries as a cause of disease in the UAE. This has decreased slightly from 20 percent of total disease burden in 1990, with transport injuries consistently remaining just over half of this total amount. Strengthening PHC services would allow resources at the secondary and tertiary levels to better meet the high levels of injuries.

45 Bell, J. (2018): HAE tightens use of antibiotics amid superbug fears and rising health insurance costs. In: Arab News. Available at: <https://www.arabnews.com/node/1257481/middle-east>

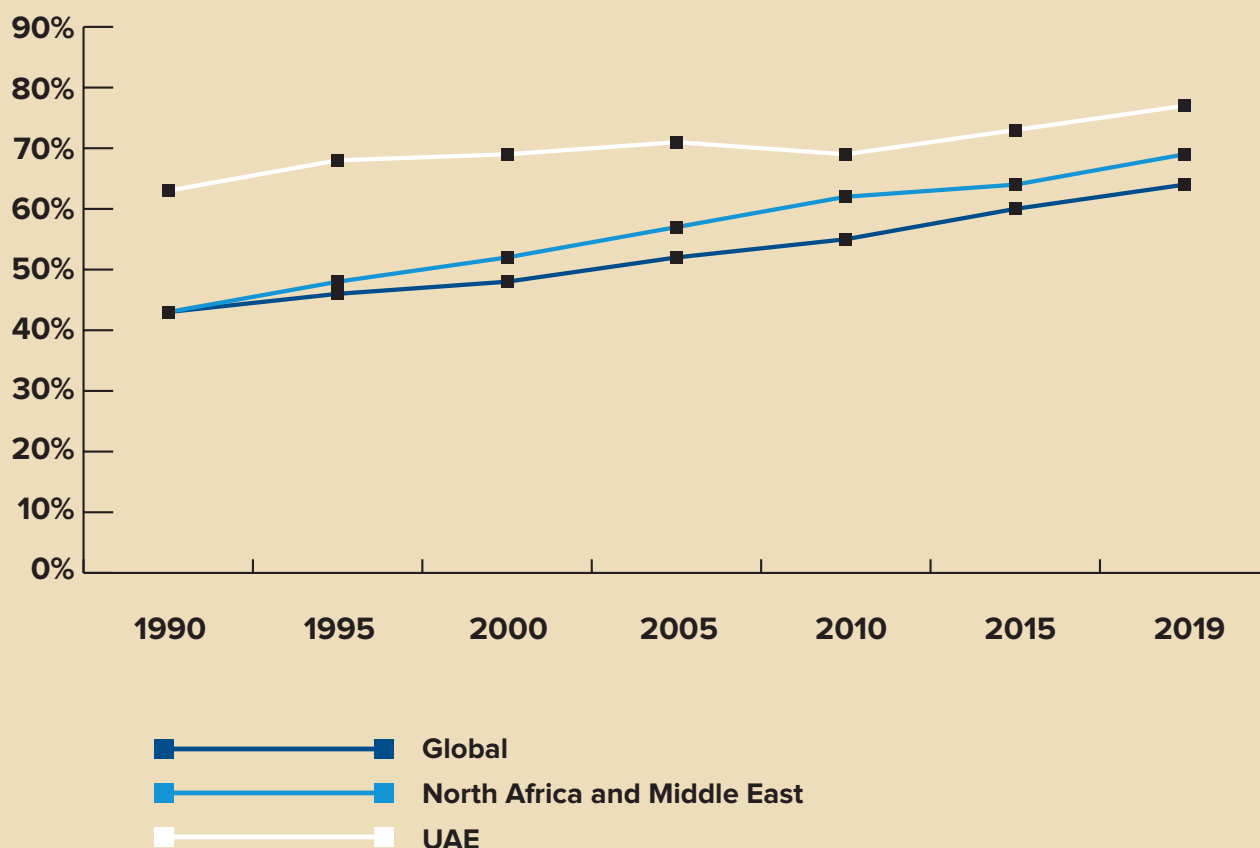
46 Bell, J. (2018): HAE tightens use of antibiotics amid superbug fears and rising health insurance costs. In: Arab News. Available at: <https://www.arabnews.com/node/1257481/middle-east>

47 Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019 (GBD 2019) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2020. Available from <https://vizhub.healthdata.org/gbd-results/>.

48 Institute for Health Metrics and Evaluation. (20220). United Arab Emirates. <https://www.healthdata.org/united-arab-emirates>

49 Institute for Health Metrics and Evaluation. (20220). United Arab Emirates. <https://www.healthdata.org/united-arab-emirates>

Figure 3: NCDs as percentage of total disease burden (in DALYs) 1990-2019 (Figure source: Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019 (GBD 2019) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2020. Available from <https://vizhub.healthdata.org/gbd-results/>.)



Box 3. The burden of NCDs in UAE⁵⁰

Detailed economic modelling for NCD Investment Cases conducted by the Gulf Health Council, UNDP and World Health Organization revealed that the four main NCDs (cancer, cardiovascular diseases, diabetes and chronic respiratory diseases) accounted for 55 percent of all deaths in the UAE in 2019. The chance of dying before the age of 70 from NCDs is nearly one in five.

NCDs do not just impact health, but also pose a major economic burden. Indeed, NCDs cost the UAE economy AED 40 billion every year, equivalent to 2.7 percent of its annual GDP. Of these annual costs, 26 percent or AED 10 billion were government healthcare expenditures.

Of note, the NCD burden above was calculated using a different methodology than the one used in this PHC study, meaning the results are not directly comparable. Indeed, in the NCD Investment Cases, the economic burden of the four main NCDs was calculated considering both direct health expenditure from government and private health providers as well as indirect economic burden from absenteeism, presenteeism and premature mortality. In contrast, this PHC report looks at the costs of a selection of clinical services delivered at public PHC.

⁵⁰ Elmusharaf K., Chestnov, R., Jung, J.S. et al. (2021) Prevention and Control of Non-Communicable Diseases in the United Arab Emirates: The Case for Investment. Geneva: UNDP, WHO, UNIATF, GHC

Results

LIST OF CLINICAL SERVICES

We included 84 clinical services in the modelling. Of these, 10 clinical services relate to the immunization programme, 38 to the non-communicable diseases programme, six to the child health programme, 10 to the nutrition programme, 14 to the mental health programme, four to the reproductive, maternal and child health programme, one to the oral and dental care programme, and one to the general practice programme (see **Annex 2** for a list of clinical services modelled).

COSTS IN 2019 – CLINICAL SERVICES

For 2019, the cost of the selected clinical services delivered at the primary care level in the public sector was estimated at US\$944,230,569 (**Table 1**). The overhead costs were estimated at US\$236,057,642.

The total cost was estimated at US\$1,180,288,211. These total costs account for 6.6 percent of the total health expenditure (THE), 11.8 percent of the government health expenditure (GHE), and represents a per capita cost of US\$120.83.

Table 1: Costs of the clinical service modelled at primary care level in UAE (2019)

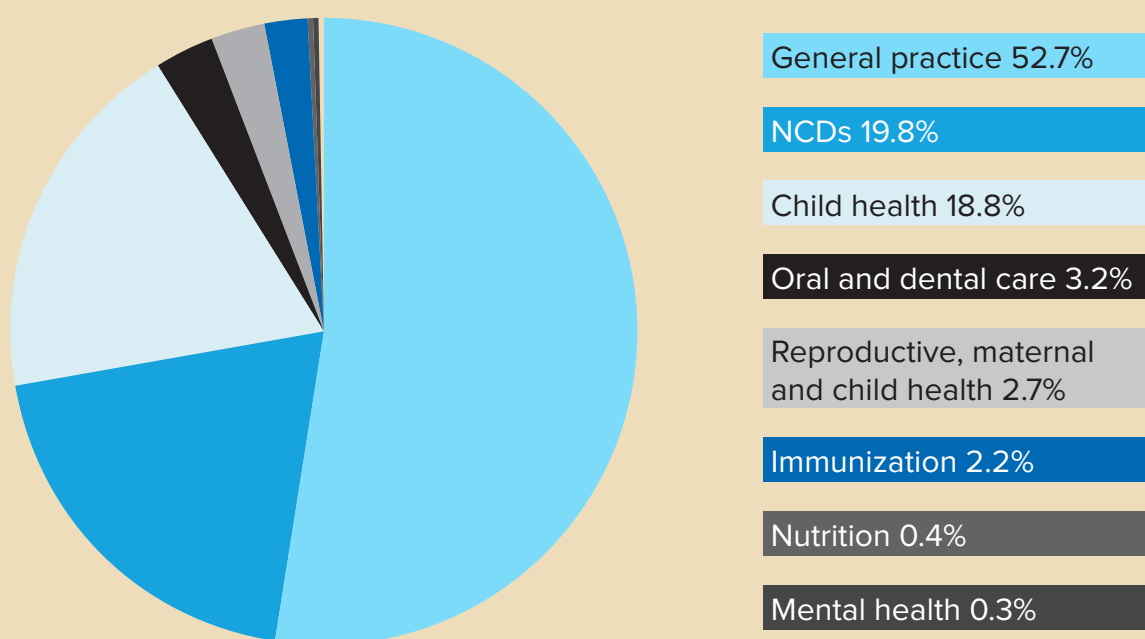
Programme	Cost (US\$)
Immunization	20,634,435
Non-communicable Diseases	187,153,598
Child Health	177,885,042
Nutrition	3,471,396
Mental Health	2,697,379
Reproductive, Maternal and Child Health	25,073,012
Oral and Dental Care	30,178,206
General Practice	497,137,500
Cost of Clinical Services	944,230,569
Overhead Costs (+20%)	236,057,642
TOTAL COSTS	1,180,288,211
Total Costs (% of THE)	6.6%

Total Costs (% of GHE)	11.8%
Total Costs per capita	US\$120.83

COSTS BY PROGRAMME

General practice accounts for 52.7 percent of the clinical service costs, with costs estimated at US\$497,137,500 in 2019 (**Figure 4**). Non-communicable diseases are the second most expensive programme, with 19.8 percent of the total costs. This is due to the high number of clinical services related to NCD control and treatment, the chronic nature of the conditions being treated, and the fact that many interventions in this category require expensive consumables. With an estimated cost of US\$2,697,379, the mental health programme generates 0.3 percent of the total costs, mainly because of low coverage rate and the fact that most of the clinical services related to mental health are currently conducted at the secondary and tertiary levels in the UAE. Indeed, an estimated 683,655 individuals did not receive mental health services they needed through public sector primary care in the UAE in 2019.

Figure 4: Share of total costs by programme, 2019 (UAE)



MAIN COST-DRIVING DISEASES

The analysis of the costs per clinical service showed that the prevention, treatment or control of diabetes, chronic respiratory diseases and cardiovascular diseases (CVD) were large sources of expenditure. By itself, treatment of diabetic patients generates a cost of more than US\$100 million every year. In total, these three most expensive clinical services accounted for 18.3 percent of the total PHC cost estimated. Please note that coverage rates and the number of patients who did not receive services needed is reflective of selected primary care level services in the public sector only, meaning patients could have received these services in private or secondary/tertiary care.

Table 2: Main cost-driving disease areas

Disease	Cost (US\$)	% of the Total Costs	Coverage rate	Patients who did not receive services needed
Cardiovascular diseases	50,233,366	5.3%	55.0%	1,147,528
Diabetes	101,246,079	10.7%	45.2%	537,901
Chronic respiratory diseases	21,678,181	2.3%	60.0%	207,110
Total	173,157,626	18.3%	53.3%	1,892,539

SCREENING

Taken altogether, services related to screening of risk of cardiovascular diseases and diabetes, cancers and diabetes complications were estimated at US\$8,133,145. This represents less than 1 percent of the total costs in 2019. Please note that coverage rates and the number of patients who did not receive services needed is reflective of selected primary care level services in the public sector only.

Table 3: Costs of top three screening services

Screening	Cost (US\$)	% of the Total Costs	Coverage rate	Patients who did not receive services needed
Screening for risk of CVD and diabetes	686,421	0.1%	5.0%	2,571,745
Screening for cancer (breast, cervix and colorectal)	4,118,805	0.4%	5.9%	444,669
Screening for diabetes complications	3,327,919	0.4%	5.0%	1,864,985
Total	8,133,145	0.9%	5.1%	4,881,399



Recommendations

The UAE recognizes the importance of strong PHC to build an effective, efficient health system and foster a healthy society. In recent years, the country has made commendable progress in strengthening PHC by establishing and expanding local training of PHC practitioners, catering for the changing disease burden of the population, and guaranteeing universal health coverage for nationals.

In this study, we estimated the costs of a selection of clinical services delivered at public primary care level in the UAE. These costs were estimated based on the cost of medical supplies as well as salaries of medical professionals needed to deliver the service. This study does not consider other factors contributing to healthcare expenditure such as governance, infrastructure or programme support costs. Further important limitations and considerations are highlighted in the methods section.

The costing analysis included in this report has highlighted a number of areas where PHC services and resource allocation in the UAE could be further strengthened. The following actions would assist the UAE to reap significant health and economic benefits across the population:

1

Strengthen NCD clinical and screening services delivered at primary care level.

NCDs account for the majority of morbidity and mortality in the UAE (80 percent and 65 percent respectively). While NCDs received the highest spending on a specific health area (behind general practice as the largest overall area), as modelled in this costing exercise, there is room to scale up coverage rates for NCD clinical services at the primary care level in the public sector to address the growing disease burden. Scaling up NCD services at a primary care level where family physicians have a detailed overview of their patients' clinical history can improve health outcomes as well as health system efficiencies.

Beyond patient-centered care, another strength of PHC is the ability to assess patients prior to developing symptoms by providing routine screening services. Less than one percent of the PHC costs modelled in this study (or around US\$8 million) were dedicated to screening services in the UAE. By expanding the breadth and coverage of screening services at the PHC level, the UAE could reduce the disease burden through early intervention as well as reduce long-term associated health costs while increasing population wellbeing. Indeed, modelling in this study suggests that nearly five million people in the UAE did not receive NCD screening services they needed through public primary care in 2019. Notably, the low numbers in the screening services modeled do not represent the total number of patients in the country receiving screening as many may access screening services through secondary or tertiary



settings, or in the private sector. However, increasing the number of patients screened at the PHC level by shifting screening services from secondary and tertiary care would provide the opportunity for more coordinated, accessible and cost-effective screening programmes in the country.

Of note, scaling up of services for NCDs will incur additional health system costs, such as workforce training and facilities, alongside a direct increase in services and the associated costs modeled in this analysis.

2

Shift mental health services from secondary to primary care facilities.

Mental health services at the PHC level currently account for just 0.3 percent of total costs modeled in this report. Of note, this is not driven by a low need for services, but rather due to a low coverage rate at the public primary care level. An estimated 680,000 people did not receive necessary mental health services from public PHC services in the UAE in 2019.

Demand for mental health services will likely have increased in recent years as it is well established that the COVID-19 pandemic has had a negative impact on many people's mental health and wellbeing. While the UAE has taken important steps, particularly during the COVID-19 pandemic, to ensure access to mental health services and reduce stigma surrounding mental health conditions, public perception and accessibility of care remain key challenges for mental health services in the country. Indeed, the majority of mental health services are currently mainly delivered at secondary or tertiary level. Integrating mental health screening and care services into public primary care (and in particular general practice) will not only ensure better access to mental healthcare for the population but has also been demonstrated to lead to better health outcomes than treatment in secondary or tertiary care. Moreover, prominent mental health services in primary care can help provide visibility to mental health disorders and provide a platform for education and awareness campaigns to reduce stigma associated with these conditions. Conceptually, scaling up mental health services in primary care is part and parcel to a people-centered approach to PHC that aims to care for patients and communities in all areas of health and disease.



3

Scale-up existing and launch new initiatives to strengthen the national healthcare workforce.

Like other countries in the region, the UAE relies on expatriate healthcare professionals and in particular nurses. Moreover, the number of doctors and nurses per 1000 population in the UAE lies below the OECD average, highlighting a clear opportunity to further expand and strengthen the national healthcare workforce. To achieve this, the UAE can scale-up existing initiatives such as scholarships provided to Emiratis wanting to become nurses. Similar initiatives could be launched to expand training opportunities at family medicine departments and attract more medical students to this specialty.

4

Leverage the modelling in this study to further improve primary care efficiencies and health outcomes.

The detailed costing in this study is a first step towards better understanding the costs associated with clinical services delivered at the primary care level in the UAE. Understanding these costs, and comparing them to budgets and expenditures, can help identify areas and services that would benefit from more resources or could be run more efficiently. The UAE can thus utilise the data and costing model generated in this report to further increase the efficiency of the primary care system, ultimately improving health outcomes.

It may also be of use to repeat this costing exercise in the near future to assess the impact of any potential changes introduced to primary care service delivery in the country. To this end, it would be beneficial to clearly define the UHC health benefits packages, as this would allow modelling of costs associated with services included in this package.

Annex 1: Assumptions used for population in need, drugs and supplies, and labour costs

Clinical Services	Population in Need	Drugs and Supply Costs	Labour Costs
Varicella vaccine	Children 1 and 5 years old, for the first and the second dose	US\$17.5 for one dose (WHO Review of vaccine price data)	Nurse (4 min) and GP (4 min) for one dose
Influenza vaccine	Children 0-5 + Pregnant women + People 65+	US\$2.39 for one dose (WHO Review of vaccine price data)	Nurse (4 min) and GP (4 min) for one dose
Retinopathy screening	People with diabetes should be screened every year (100%)	-	-
Neuropathy screening	People with diabetes should be screened every year (100%)	-	-
Clinical breast examination	Women aged 40-70 should be screened every 2 years (50%)	-	-
Diagnosis after screened with clinical breast examination	Based on country breast cancer incidence rate (WHO – IARC 2020)	-	-
Pap smear	Women 30-49 should be screened every 3 years (33%)	-	-
Fecal occult blood screening	People 50+ should be screened every 10 years (10%)	-	-
Dental cleaning and preventive care	All population	No costs estimated	Nurse (20 min) and Dentist (15 min) for one visit
General child health	Children 0-14	Cost per outpatient visit (WHO-CHOICE) – Labour costs	GP (15 min) for one visit
Pneumonia treatment	-	-	Nurse (20 min) + GP (20 min) for one visit
Daily iron and folic acid supplementation (anaemic pregnant women)	100% of anaemic pregnant women (World Bank)	-	-
Intermittent iron folic acid supplementation (non anaemic pregnant women)	100% of non anaemic pregnant women (World Bank)	-	-
Daily FAF, postpartum, non anaemic women	Based on number of live births (Annual Health Statistics) and percentage of anaemic women (World Bank)		

Intermittent FAF, postpartum, anaemic women	Based on number of live births (Annual Health Statistics) and percentage of non anaemic women (World Bank)		
Care for adults with low body mass index (BMI)	100% of underweight adults (Global Nutrition Report)	-	-
All mental health clinical services	Based on prevalence rates (Zuberi et al. 2021, GBD 2016 Epilepsy Collaborators, GBD 2016 Dementia Collaborators, WHO-EMRO, Atlas of Substance Disorder).	-	-
Treatment of postpartum haemorrhage (PPH)	Based on incidence rates of PPH	-	-
Identification and management of infertility	Based on regional prevalence (Eldib 2018) among adults 15-49 (3.8%)	-	-
Treatment of syphilis	Based on regional incidence rates (Kenyon et al. 2014) among adults 15-49 (2.2%)	-	-
Treatment of gonorrhea	Based on regional incidence rates (Kenyon et al. 2014) among adults 15-49 (0.9%)	-	-
Treatment of chlamydia	Based on regional incidence rates (Kenyon et al. 2014) among adults 15-49 (1.9%)	-	-
Treatment of trichomoniasis	Based on regional incidence rates (Kenyon et al. 2014) among adults 15-49 (2.8%)	-	-
Treatment of pelvic inflammatory infection	Based on US incidence rate (Kresiel 2021) among adults 15-49 (3.6%)	-	-
General practice	All population	Cost per outpatient visit (WHO-CHOICE) – Labour costs	GP (15 min) for one visit
Screening: mammography	Women aged 40-70 should be screened every 2 years (50%)	-	-
Diagnosis for breast cancer	Based on country breast cancer incidence rate (WHO – IARC 2020)	-	-
Visual inspection with acetic acid, HPV DNA + VIA.	Based on country cervix cancer incidence rate (WHO – IARC 2020)	-	-

Screening; fecal immunochemical test	Based on country colorectal cancer incidence rate (WHO – IARC 2020)	-	-
Diagnosis for colorectal cancer	Based on country colorectal cancer incidence rate (WHO – IARC 2020)	-	-
Routine child healthcare visit (1 year)	Children 0-12 months (100%)	Estimate based on OHT drugs and supplies prices: US\$19.7	Nurse (20 min), GP (10 min)
Routine child healthcare visit (1-5 years)	Children 12-59 months (100%)	Estimate based on OHT drugs and supplies prices: US\$2.8	Nurse (20 min), GP (10 min)
Nutrition: Care for obese adults	People with obesity (Global Nutrition Report)	No costs estimated	GP (10 min)
Nutrition: Care for diabetic adults	People with diabetes (OHT)	No costs estimated	GP (10 min)
Nutrition: Care for adults with kidney diseases			
Adults with chronic kidney disease (Al-Shamsi et al. 2018)	No costs estimated	GP (10 min)	
Nutrition: Care for adults with nutritional anaemia	Adults with anaemia (Global Nutrition Report)	No costs estimated	GP (10 min)
Nutrition: Care for adults with food allergies and sensitivities	People with nutrition-related allergies (Althumiri et al. 2021)	No costs estimated	GP (10 min), Specialist Doctor (30 min)
Management of food allergies and food intolerance	Children 0-14 x Global Prevalence of Allergies (3.0%)	No costs estimated	GP (10 min), Specialist Doctor (30 min)
Preconception care	Married women or planning for marriage at reproductive age (15-49 years)	Estimate based on OHT drugs and supplies prices: US\$4.90	Nurse (15 min), GP (15 min)
Antenatal care	Pregnant women	Estimate based on OHT drugs and supplies prices: US\$36.42	GP (40 min), Radiographer (20 min), Midwife (40 min)
Postnatal care	Women who gave birth	No costs estimated	Nurse (15 min), GP (15 min)
Premarital screening program	Women (15-49) planning for a marriage	Estimate based on OHT drugs and supplies prices: US\$15.66	Nurse (15 min), GP (15 min)
All Services	-	-	Community health workers time was allocated to nurses

Annex 2: Breakdown of costs for clinical services provided at PHC level

Clinical services provided at PHC Level	Drug & Supplies Costs (AED)	Health Providers Costs (AED), 2019	Total Costs (AED) (Drugs & Supplies and Providers)
IMMUNIZATION			
Rotavirus vaccine	1,577,623	3,823,955	5,401,578
Measles vaccine	258,292	4,114,908	4,373,199
Diphtheria, Tetanus and Pertussis (DPT) vaccine	671,595	6,172,361	6,843,957
Hib vaccine	3,775,471	6,172,361	9,947,832
Hepatitis B (Hep B) vaccine	8,281,207	6,110,014	14,391,222
Polio vaccine	188,776	7,897,298	8,086,074
BCG vaccine	196,648	1,953,542	2,150,190
Pneumococcal vaccine	3,392,952	8,229,815	11,622,767
HPV vaccine	629,983	781,185	1,411,168
Influenza vaccine	6,096,325	6,099,524	12,195,849
NON-COMMUNICABLE DISEASES			
CVD & Diabetes		-	-
Screening for risk of CVD/Diabetes	1,202,464	1,339,835	2,542,300
Follow-up care for those at low risk of CVD/ Diabetes (Absolute Risk: 10-20%)	63,787	71,074	134,862
Treatment for those with very high cholesterol but low absolute risk of CVD/ Diabetes (< 20%)	834,833	1,120,733	1,955,567
Treatment for those with high blood pressure but low absolute risk of CVD/Diabetes (< 20%)	47,863,161	105,262,484	153,125,645
Treatment for those with absolute risk of CVD/Diabetes 20-30%	4,569,604	4,895,956	9,465,560
Treatment for those with high absolute risk of CVD/Diabetes (>30%)	6,563,167	9,061,886	15,625,052
Treatment of new cases of acute myocardial infarction (AMI) with aspirin	508,056	459,593	967,649
Treatment of cases with established ischaemic heart disease (IHD)	812,743	583,769	1,396,512

Clinical services provided at PHC Level	Drug & Supplies Costs (AED)	Health Providers Costs (AED), 2019	Total Costs (AED) (Drugs & Supplies and Providers)
Treatment for those with established cerebrovascular disease and post stroke	1,724,380	1,574,600	3,298,980
Treatment of cases with rheumatic heart disease (with benzathine penicillin)	5,786	73,889	79,675
Standard Glycemic control	291,877,761	47,845,247	339,723,008
Intensive Glycemic control	29,250,019	6,012,453	35,262,472
Retinopathy screening	186,728	2,833,852	3,020,580
Neuropathy screening and preventive foot care	3,165,032	6,140,013	9,305,045
Breast Cancer			
Basic breast cancer awareness	-	917,607	917,607
Screening: clinical breast examination	-	1,998,760	1,998,760
Screening: mammography	29,453	689,871	719,324
Diagnosis after screened with clinical breast exam	6,982,356	-	6,982,356
Diagnosis after screened with mammography	6,684,540	-	6,684,540
Diagnosis without screening for breast cancer	4,902,834	-	4,902,834
Cervical Cancer		-	-
Visual inspection with acetic acid (VIA)	112,826	1,320,860	1,433,686
Papanicolaou test (Pap smear)	198,935	4,130,772	4,329,707
HPV DNA + VIA	961,165	4,803,126	5,764,291
Colorectal Cancer		-	-
Screening: Fecal immunochemical test	2,637	41,658	44,295
Screening: Fecal occult blood testing	5,506	41,658	47,164
Diagnosis for colorectal cancer screened with FIT	1,142,520	-	1,142,520
Diagnosis for colorectal cancer screened with FOBT	1,428,151	-	1,428,151
Diagnosis without screening for colorectal cancer (symptom based)	95,210	-	95,210
RESPIRATORY DISEASE		-	-
Asthma: Inhaled short acting beta agonist for intermittent asthma	3,045,207	4,759,421	7,804,627
Asthma: Low dose inhaled beclometasone + SABA	16,499,484	9,518,841	26,018,325

Clinical services provided at PHC Level	Drug & Supplies Costs (AED)	Health Providers Costs (AED), 2019	Total Costs (AED) (Drugs & Supplies and Providers)
Asthma: High dose inhaled beclometasone + SABA	20,181,415	7,139,131	27,320,547
COPD: Smoking cessation	-	500,453	500,453
COPD: Inhaled salbutamol	3,879,876	6,063,945	9,943,821
COPD: Ipratropium inhaler	1,062,224	933,847	1,996,071
COPD: Exacerbation treatment with antibiotics	11,292	1,722,594	1,733,886
COPD: Exacerbation treatment with oral prednisolone	94,810	1,722,594	1,817,404
COPD: Exacerbation treatment with oxygen	1,116,941	2,037,485	3,154,426
EMERGENCY CARE		-	-
Average annual emergency care needs	478,565	-	690,824
ORAL AND DENTAL CARE			
Oral and Dental Care			
CHILD HEALTH			
General Health (Children)			
General Health (Children)	493,544,331	120,205,669	613,750,000
Diarrhea management			
Oral rehydrating salts	49,664	1,115,526	1,165,190
Antibiotics for treatment of dysentery	6,208	111,553	117,761
Pneumonia			
Pneumonia treatment (children)	6,691	464,802	471,494
Routine Child Healthcare Visit			
Routine Child Healthcare Visit (< 1 year)	5,645,989	5,599,843	11,245,832
Routine Child Healthcare Visit (1-5 years)	4,039,289	28,043,923	32,083,212
NUTRITION			
Adults			
Care for obese adults	0	4,375,573	4,375,573
Care for diabetic adults	0	1,573,206	1,573,206
Care for adults with kidney diseases	0	1,108,941	1,108,941
Care for adults with nutritional anaemia	0	786,333	786,333
Care for adults with food allergies and sensitivities	0	400,530	400,530

Clinical services provided at PHC Level	Drug & Supplies Costs (AED)	Health Providers Costs (AED), 2019	Total Costs (AED) (Drugs & Supplies and Providers)
All population			
Food fortification	1,269,853	-	1,269,853
Children			
Management of severe malnutrition	179,485	2,087,693	2,267,178
Management of moderate acute malnutrition	532,218	162,681	694,899
Management of food allergies or food intolerances	0	380,511	380,511
MENTAL HEALTH			
Anxiety Disorders			
Basic psychosocial treatment and anti-depressant medication for anxiety disorders (moderate-severe cases)	-	2,769,765	2,769,765
Basic psychological treatment for anxiety disorders (mild cases).	86,672	3,187,842	3,274,514
Depression			
Basic psychosocial treatment for mild depression	-	416,386	416,386
Basic psychosocial treatment and anti-depressant medication of first episode moderate-severe cases	16,721	174,882	191,604
Intensive psychosocial treatment and anti-depressant medication of recurrent moderate-severe cases on a maintenance basis	79,117	1,818,718	1,897,836
Psychological care for peri-natal	-	260,021	260,021
Psychosis			
Basic psychosocial support and anti-psychotic medication	27,756	123,327	151,083
Bipolar disorders			
Basic psychosocial treatment, advice, and follow-up for bipolar disorder, plus mood-stabilizing medication	224,186	258,438	482,624
Epilepsy			
Basic psychosocial support, advice, and follow-up, plus anti-epileptic medication	0	0	0
Developmental disorders			
Basic psychosocial treatment, advice, and follow-up for developmental disorders	0	0	0

Clinical services provided at PHC Level	Drug & Supplies Costs (AED)	Health Providers Costs (AED), 2019	Total Costs (AED) (Drugs & Supplies and Providers)
Conduct disorders			
Basic psychosocial treatment, advice, and follow-up for behavioural disorders	-	442,128	442,128
Attention disorders			
Methylphenidate medication	16,738	8,633	25,371
Dementia			
Assessment, diagnosis, advice, and follow-up for dementia	1,075	18,217	19,292
Pharmacological treatment of dementia	10,170	9,826	19,996
Alcohol use/dependence			
Identification and assessment of new cases of alcohol use/dependence	-	7,278	7,278
Drug use/dependence			
Drug use/dependence			
MATERNAL NEONATAL AND REPRODUCTIVE HEALTH			
Preconception care (PCC)			
Preconception care (PCC)	267,475	1,156,408	1,423,883
Antenatal care (ANC)			
Antenatal care (ANC)	29,049,290	53,638,907	82,688,197
Postnatal care (PNC)			
Postnatal care (PNC)	-	6,356,323	6,356,323
Premarital screening programme			
Premarital screening programme	1,017,927	1,376,676	2,394,603
GENERAL PRACTICE			
General Practice	1,480,632,992	360,617,008	1,841,250,000

- cost not estimated

Annex 3: References and assumptions used to estimate the total number of services delivered

Clinical services provided at PHC Level	
IMMUNIZATION	
Rotavirus vaccine	WHO-UNICEF Estimates 2019
Measles vaccine	
DPT vaccine	
Hib vaccine	
Hep B vaccine	
Polio vaccine	
BCG vaccine	
Pneumococcal vaccine	
HPV vaccine	HPV Center
Influenza vaccine	Estimation based on Bahrain CR
NON-COMMUNICABLE DISEASES	
CVD & Diabetes	
Screening for risk of CVD/Diabetes	Assumption: 5.0%
Follow-up care for those at low risk of CVD/Diabetes (Absolute Risk: 10-20%)	Assumption: 5.0%
Treatment for those with very high cholesterol but low absolute risk of CVD/Diabetes (< 20%)	Estimation based on UHC Service Coverage Sub-Index on NCDs (WHO)
Treatment for those with high blood pressure but low absolute risk of CVD/Diabetes (< 20%)	
Treatment for those with absolute risk of CVD/Diabetes 20-30%	
Treatment for those with high absolute risk of CVD/Diabetes (>30%)	
Treatment of new cases of acute myocardial infarction (AMI) with aspirin	
Treatment of cases with established ischaemic heart disease (IHD)	
Treatment for those with established cerebrovascular disease and post stroke	
Treatment of cases with rheumatic heart disease (with benzathine penicillin)	Estimation based on OneHealth Tool and Dubai Government Annual Health Statistics Book 2019
Standard Glycemic control	
Intensive Glycemic control	
Retinopathy screening	
Neuropathy screening and preventive foot care	

Clinical services provided at PHC Level	
Breast Cancer	
Basic breast cancer awareness	Assumption: 5.0%
Screening: Clinical Breast Examination	Estimation based on Bahrain Coverage Rate (CR)
Screening: Mammography	Assumption: 0.9%
Diagnosis after Screened with Clinical Breast Exam	Estimation based on breast cancer incidence (WHO IARC 2020)
Diagnosis after Screened with Mammography	
Diagnosis without screening for breast cancer	
Cervical Cancer	
Visual inspection with acetic acid (VIA)	Assumption: 5.0%
Papanicolaou test (Pap smear)	Assumption: 9.3%
HPV DNA + VIA	Assumption: 5.0%
Colorectal Cancer	
Screening: Fecal immunochemical test	Assumption : 0.5%
Screening: Fecal occult blood testing	
Diagnosis for colorectal cancer screened with FIT	Assumption: 100%
Diagnosis for colorectal cancer screened with FOBT	
Diagnosis without screening for colorectal cancer (symptom based)	
RESPIRATORY DISEASE	
Asthma: Inhaled short acting beta agonist for intermittent asthma	Estimation based on UHC Service Coverage Sub-Index on NCDs (WHO)
Asthma: Low dose inhaled beclometasone + short-acting beta-agonists (SABA)	
Asthma: High dose inhaled beclometasone + SABA	
Chronic obstructive pulmonary disease (COPD): Smoking cessation	
COPD: Inhaled salbutamol	
COPD: Ipratropium inhaler	
COPD: Excacerbation treatment with antibiotics	
COPD: Excacerbation treatment with oral prednisolone	
COPD: Excacerbation treatment with oxygen	
EMERGENCY CARE	
Average annual emergency care needs	N/A
ORAL AND DENTAL CARE	
Oral and Dental Care	Estimation based on Dubai Government Annual Health Statistics Book

Clinical services provided at PHC Level	
CHILD HEALTH	
General Health (Children)	Estimation: 25% of GP visits allocated to General Health
General Health (Children)	
Diarrhea management	
Oral rehydrating salts	Estimation based on UHC Service Coverage Index (WHO)
Antibiotics for treatment of dysentery	
Pneumonia	
Pneumonia treatment (children)	Estimation based on UHC Service Coverage Index (WHO)
Routine Child Healthcare Visit	
Routine Child Healthcare Visit (< 1 year)	Estimation based on UHC Service Coverage Index (WHO)
Routine Child Healthcare Visit (1-5 years)	
NUTRITION	
Adults	
Care for obese adults	Assumption: 5.0%
Care for diabetic adults	
Care for adults with hyperuricemia	
Care for adults with kidney diseases	
Care for adults with nutritional aneamia	
Care for adults with food allergies and sensitivities	
Food fortification	Assumption: 100%
Children	
Management of severe malnutrition	Estimation based on UHC Service Coverage Index (WHO)
Management of moderate acute malnutrition	
Management of food allergies or food intolerances	Assumption: 5.0%
MENTAL HEALTH	
Anxiety Disorders	
Basic psychosocial treatment and anti-depressant medication for anxiety disorders (moderate-severe cases)	Estimation based on Abu Dhabi Government Annual Health Statistics
Basic psychological treatment for anxiety disorders (mild cases).	

Clinical services provided at PHC Level	
Depression	
Basic psychosocial treatment for mild depression	Estimation based on Abu Dhabi Government Annual Health Statistics
Basic psychosocial treatment and anti-depressant medication of first episode moderate-severe cases	
Intensive psychosocial treatment and anti-depressant medication of recurrent moderate-severe cases on a maintenance basis	
Psychological care for peri-natal	
Psychosis	
Basic psychosocial support and anti-psychotic medication	Estimation based on Abu Dhabi Government Annual Health Statistics
Bipolar disorders	
Basic psychosocial treatment, advice, and follow-up for bipolar disorder, plus mood-stabilizing medication	Estimation based on Abu Dhabi Government Annual Health Statistics
Epilepsy	
Basic psychosocial support, advice, and follow-up, plus anti-epileptic medication	Estimation based on Abu Dhabi Government Annual Health Statistics
Developmental disorders	
Basic psychosocial treatment, advice, and follow-up for developmental disorders	Estimation based on Abu Dhabi Government Annual Health Statistics
Conduct disorders	
Basic psychosocial treatment, advice, and follow-up for behavioural disorders	Estimation based on Abu Dhabi Government Annual Health Statistics
Attention disorders	
Methylphenidate medication	Estimation based on Abu Dhabi Government Annual Health Statistics
Dementia	
Assessment, diagnosis, advice, and follow-up for dementia	Estimation based on Abu Dhabi Government Annual Health Statistics
Pharmacological treatment of dementia	
Alcohol Use/Dependence	
Identification and assessment of new cases of alcohol use/dependence	Estimation based on Abu Dhabi Government Annual Health Statistics
Drug Use/Dependence	
Brief interventions and follow-up for drug use/dependence	Estimation based on Abu Dhabi Government Annual Health Statistics

Clinical services provided at PHC Level	
MATERNAL NEONATAL AND REPRODUCTIVE HEALTH	
Preconception care (PCC)	
Preconception Care (PCC)	Estimation based on UHC Service Coverage Sub-Index on MNCH (WHO)
Antenatal care (ANC)	
Antenatal Care (ANC)	Estimation based on 99% ANC Coverage
Postnatal care (PNC)	
Postnatal Care (PNC)	Estimation based on UHC Service Coverage Sub-Index on MNCH (WHO)
Premarital screening programme	
Premarital screening programme	Assumption: 100%
GENERAL PRACTICE	
General Practice	Estimation based on Dubai Government Annual Health Statistics Book



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