Supplemental Material 1. Summary of characteristics and findings of the included studies on the challenges of universal health coverage

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| REf. | Year/ method/ study setting | Main finding  challenges & authors suggestions |
| Hashimoto et al([25](#_ENREF_25)). | 2020.  Cross-sectional study.  Haiti. | **Challenges:**   * Low geographic access (insufficient number of facilities, difficulties in reaching the facilities, local customs). * Strained financial access (government’s insufficient budgets, inefficient budget allocation, ineffective management control systems). * Limited service access (lack of basic infrastructure and resources, underdeveloped people-centered care, gaps between the essential service package, health professionals’ skills, and the needs). |
| Paul et al([33](#_ENREF_33)). | 2020.  Cross-sectional study.  Benin. | **Challenges:**   * Budgeting challenges. * The fiscal space is quite limited. * limited potential for new taxes. * The purchasing of health services should be more strategic. * The efficiency of the expenditure process needs to be improved, and more autonomy needs to be devoted to the operational level. |
| Mathauer et al([34](#_ENREF_34)). | 2020.  Policy & practice.  World. | **Challenges:**   * In many countries pooling arrangements are very fragmented, which create barriers to redistribution. |
| Maqbool et al([23](#_ENREF_23)). | 2019.  Review.  India. | **Challenges:**   * largest disease burden in the world. * Reproductive and child health issues, malnutrition. * Issues of gender equality. * Poor availability of trained human resources in health. * Inadequate research to achieve health-care for all. * Commercialized, fragmented, and unregulated healthcare delivery systems. * Inequalities in access to health-care. * Imbalance in resource allocation. * High out of pocket health expenditures. * Rising aging population. * Social determinants of health such as poverty, illiteracy, alcoholism etc. * Too frequent and too severe natural disasters. * Lack of inter-sectoral coordination and political pull and push of different forces and interests. |
| Sajadi et al([22](#_ENREF_22)). | 2019.  Debate article. Iran. | **Challenges:**   * Three important challenges exist in achieving the goals of UHC: sustainability of resources, well-established and updated service delivery arrangement, and strong governance arrangement. |
| Joarder et al([24](#_ENREF_24)). | 2019  Qualitative study.  Bangladesh. | **Challenges:**   * A rigid public financing structure dating from the colonial era. * Public financial management has been designed such that only health sector finance is very difficult to alter separately. * Since the purchasing power of people is increasing, their health seeking behavior is changing consequently, culminating in higher healthcare cost. * The overall healthcare expenditure is increasing, which requires more funding to address. * Implementation of UHC is becoming progressively expensive. * The regulatory mechanism is not adequately functioning to regulate the private sector. * Unqualified providers often continue harmful medical practices, capitalizing loopholes in the regulatory framework and its implementation. * Deficiency in health systems governance and stewardship. * Accountability and transparency are difficult to ensure in public sector, especially in the presence of a highly centralized system. |
| soltani et al([32](#_ENREF_32)). | 2019.  Qualitative study.  Iran. | **Challenges:**   * Health insurance: lack of insurance coverage for services like dentistry, occupational therapy and speech therapy, Lack of coverage for rehabilitation supplies and equipment, i.e. wheelchairs, walkers, insoles, braces, prosthetic limbs, disproportionate copayment for physical therapy, laboratory tests and some medicines. * Affordability: low income for people with disability (PWD) and their family. * Financial supports: low levels of pensions for people with disabilities, mismatch between the allocation of subsides and the severity of disability and socioeconomic status, confusion about the condition of health costs reimbursement. * Transportation costs: high cost of transportation to reach healthcare facilities for PWD.   **Authors suggestions:**   * To achieve universal health coverage (UHC) in Iran, reducing barriers to effective health insurance for people with disability (PWD) to ensure their equitable access to needed healthcare services is crucial. |
| Massuda et al([15](#_ENREF_15)). | 2019.  Report.  Brazil. | **Challenges:**   * A chain of events that threatens progress toward universal health coverage, reversing recent gains, increasing unmet health needs and increasing the risk of public health emergencies is expected in Brazil. * Economic recession and austerity policies are jeopardizing the progress to UHC in several countries, worsening health outcomes and disproportionally affecting populations. In Brazil, an economic and political crisis followed by austerity legislation is affecting social rights enshrined in the country by the 1988 constitution, including the right to health. |
| Gilbert et al([16](#_ENREF_16)). | 2019.  Report.  The 22 Pacific Island countries and territories. | **Challenges:**   * Delivering Integrated PHC services with appropriate service delivery models: within the ministry of health (MOH) there is limited partnership across programs. Currently, each service is planned in isolation, leading to gaps and overlaps, and missed opportunities to share and maximize resources. * Increasing the share of resources allocated to lower level health facilities and community-based services for PHC: resources are mostly allocated heavy top down, which does not align itself to the concept of the PHC approach and role delineation to provincial levels. The challenge is always there and that is to reverse the resource allocation and make it heavy bottom up because that is where 80% of the services are where people live. * Improving managerial, administration, or supervisory capacity to ensure that allocated resources reach and are well used for PHC: there are gaps in managerial, administrative, and supervisory capacity from the executive down to facilities in MOHs across Pacific Island countries (PICs). These include gaps in fundamental business practices (human resources, finance, and procurement) in MOH headquarters. In both centralized and decentralized systems, there is also a perceived need to create more capability to manage budget and take action locally so that facilities can “buy a nail” without engaging the central/subnational level. In addition, there is an absence of a managerial feedback loop, in part due to limited supervision and empowerment of facilities. |
| Fahim et al([35](#_ENREF_35)). | 2019.  Review.  Bangladesh. | **Challenges:**   * Complex interplay between inadequacy of allocation, inequity of distribution, and inefficiency of utilization of allotted money in health. * Catastrophic health expenditure and financial hardship towards access to health care. * Rapid privatization of health care services leading to rise of treatment cost. * Ensure the good health and well‐being of the large number of economically active population in coming decades. * Aging of the population with a risk of increasing geriatric problems. * Rising burden of non-communicable diseases. * Emerging threats due to climate change.   **Authors suggestions:**   * Policy makers must think effectively to develop and adapt national health financing systems for providing financial risk protection in order to achieve universal coverage and ensure health for all. |
| Ranabhat et al([28](#_ENREF_28)). | 2019.  Systematic review.  Nepal. | **Challenges:**   * Existing volunteer types of health insurance. * Misleading role of trade unions. * High proportion of population outside the country.   **Authors suggestions:**   * To achieve UHC, service and population coverage of health services has to be expanded along with financial protection for marginalized communities. * Government stewardship, support of stakeholders and fair contribution and distribution of resources by appropriate health financing modality can speed up the path of UHC in Nepal. |
| Agustina et al([29](#_ENREF_29)). | 2019.  Review.  Indonesia. | **Challenges:**   * Financial sustainability issues. * Challenges of the missing middle for the national health insurance system (NHIS) : The so-called missing middle remains a problem wherein people who work in the informal sector and who are not living in poverty are not covered by the NHIS because of low self-enrolment. * Equity gap in insurance coverage: important gaps and heterogeneity exist across age groups and socioeconomic status. * Challenges in service preparedness: the challenges in service preparedness increase with the rapid growth of the population covered by the NHIS. Even incremental increases in patient loads will strain the carrying capacity of existing providers to ensure timely and quality service delivery. Inadequate medical facilities remain an issue, especially for public hospitals and community health centers. * The poor quality of care at community health centers and hospitals is especially serious. * Absence of integrated clinical and frontline health worker data, and the suboptimal health information system, and limited use of existing data.   **Authors suggestions:**   * An integrated dynamic UHC system that is adaptable to a rapidly developing society can provide an affordable and sustainable path toward health for all, and achievement of the underlying principles and targets of the SDGs. * To overcome financial issues affecting overall UHC sustainability, four policy options have been suggested: first, increase fees for contributing members, given that current contributions are lower than the costs of medical treatment; second, embrace cost-containment measures, such as soft caps on service volumes; third, improve the health-care reimbursement process by more rigorous medical claim reviews; fourth, promote efficiency of the NHIS system. |
| Umeh([4](#_ENREF_4)). | 2018.  Review.  Ghana, Kenya, Nigeria, and Tanzania. | **Challenges:**   * large proportion of the population living in extreme poverty and unable to pay premiums. * large informal sector whose members are mostly uninsured. * High dropout rate from insurance schemes. * Poorly funded primary health care system. * Segmented health insurance fund pool. * Lack of support from key stakeholder. * Inadequate health infrastructure / perceived poor quality of care. * Inefficiencies in the management of the insurance scheme.   **Authors suggestions:**   * Raise sufficient revenue to finance their health systems. * Improve the efficiency of revenue utilization. * Identify and provide coverage for the very poor. * Reduce the proportion of the population that is underinsured. * Improve access to quality health care in rural areas. |
| Shan et al([17](#_ENREF_17)). | 2017.  Cross-sectional questionnaire survey.  China. | **Challenges:**   * A lack of capacity to offer effective financial protection was identified as the most important challenge hindering the achievement of UHC. * Large healthcare inequity. * A lack of portability of entitlements of health insurance programmes was perceived as one of the barriers to achieving UHC. * Ineffective supervision and administration of funds. |
| França et al([20](#_ENREF_20)). | 2016.  Qualitative study.  Brazil. | **Challenges:**   * Failures in the expansion and strengthening of the services. * Absence of diagnosis of the priority demands. * Shortage of technology, equipment, and material and human resources. * Poor local infrastructure. * Actions with low resolutive power and absence of interdepartmental policies. |
| Reich et al([5](#_ENREF_5)). | 2016.  Health policy report.  Bangladesh, Brazil, Ethiopia, France, Ghana, Indonesia, Japan, Peru, Thailand, Turkey, and Vietnam. | **Challenges:**   * Adoption of UHC goals: UHC goals are often adopted in conjunction with a major social, economic, or political change. * expansion of health coverage. * Reduction of inequities in coverage. * All countries in the study have faced challenges in ﬁnding suﬃcient government ﬁnances to support UHC policies and programmes, since expansion of coverage calls for a signiﬁcant increase in public spending. * The study shows that providing universal coverage for the entire population needs diﬀerent forms of cross subsidization, both from rich to poor and from low-risk groups (e.g., the young) to high-risk populations (e.g., the elderly). * All 11 countries in the study have faced major challenges in the production, performance, and distribution of health workers in relation to UHC goals. * The shortage of health workers is a global challenge, but this problem is especially acute for countries in early stages of UHC adoption and implementation.   **Authors suggestions:**   * Movement towards UHC is a long-term policy engagement that needs both technical knowledge and political know-how. * Technical solutions need to be accompanied by pragmatic and innovative strategies that address the national political economy context. * Strategic management of interest group pressures is essential to enable reforms to be successful. * Economic growth was not a necessary condition for the adoption of UHC policies, although growth was important in supporting the subsequent expansion of coverage. |
| Hussein([1](#_ENREF_1)). | 2015.  Review. | **Challenges:**   * Inadequate quality of services. * Inadequate human resources for UHC. * Leveraging the concept of people-centered UHC. * Ensuring affordable care.   **Authors Suggestions:**   * Affordability does not always translate into improvements in access. Thus, a more holistic approach is needed to understand the dimensions of access in order to be properly incorporated in the UHC schemes. * UHC schemes should be designed to cover all country population, including poor in addition to non-poor with special strategies. * UHC benefits should be harmonized with target populations’ needs by considering indicators, such as the population’s epidemiological profile, major barriers to access, major sources of financial hardship, etc. * Successful UHC interventions initiatives should be highly focused on country’s health needs and priorities. |
| Bredenkamp et al([13](#_ENREF_13)). | 2015.  Discusses.  East Asia, especially the larger countries of China,  Indonesia, Philippines, Thailand and Vietnam. | **Challenges:**   * How to ensure coverage of the informal sector so as to make UHC truly universal. * How to design a benefit package that is responsive and appropriate to current health challenges, yet fiscally sustainable. * How to ensure “supply-side readiness”, i.e. the availability and quality of services, which is a necessary condition for translating coverage into improvements in health outcomes.   **Authors suggestions:**   * using general revenues to fully cover the informal sector, or employing a combination of tax subsidies, non-financial incentives and contributory requirements. |
| Van Minh et al([3](#_ENREF_3)). | 2014.  Review.  Brunei, Cambodia, Indonesia,  Lao PDR, Malaysia, Myanmar (Burma), the Philippines, Singapore, Thailand, and Vietnam. | **Challenges:**   * Financial constraints, including low levels of overall and government spending on health. * Supply side constraints, including inadequate numbers and densities of health workers. * The ongoing epidemiological transition at different stages characterized by increasing burdens of non-communicable diseases, persisting infectious diseases, and reemergence of potentially pandemic infectious diseases. |
| Saleh et al([21](#_ENREF_21)). | 2014.  Report.  Egypt, Libya,  Tunisia, and Yemen. | **Challenges:**   * Weak focus on primary health care: the main challenge to expand primary health services is the shortage of required financing and deployment of health staff to remote areas. * Unclear political landscape and social agenda. * Investment in health and fragmented financing systems. * Poor trust in public facilities. * Sociopolitical instability and persisting emergencies. * Underdeveloped health information systems and evidence for policy making. * Governance and institutional capacity (managerial and organizational structures) at ministries of health and social insurance organizations: existing governance and organizational structures in the public health sector have not been modified for a long time. |
| Tripathy([26](#_ENREF_26)). | 2014.  Memorial Oration.  India. | **Challenges:**   * Public health challenges like demographic transition, epidemiological transition, low equity and low GDP will be challenges for UHC. * Prioritization across the three-dimensions of coverage population, service, and cost is perhaps the most difficult political challenge on the path toward UHC. |
| Titelman et al([31](#_ENREF_31)). | 2014.  Health Policy.  Latin American countries. | **Challenges:**   * The proportion of out-of-pocket spending is high. * Spend on health is little.   **Authors suggestions:**   * Increased tax revenue and a balanced combination of resources from general taxation and payroll taxes that does not create incentives for informality, evasion, or avoidance. * Efforts by governments to increase the share of public expenditure in health, so that ability to make out-of-pocket payments is not an access barrier to health services. * Improved allocation and distribution of that spending, by means of a new model to integrate different sources, able to secure funds for subnational governments. * Equitable funding to increase the redistribution capacity of tax systems. |
| Marten et al([18](#_ENREF_18)). | 2014.  Health policy.  Brazil, Russia, India, China, and South Africa. | **Challenges:**   * Human resources are insufficient. * Although the government is committed to pursuing UHC, these plans face opposition from some groups, although often not overtly. * Cost control remains a serious challenge. Without effective cost containment—e.g., controlling oversupply of tests and use of expensive medicines by setting regulations increased investments would not be transferred to improved access, and thus the goal to implement UHC by 2020 would be jeopardized. * Coordinated political will at both the state and central levels is required. * Require additional financial resources. * Key challenge is how to combine the guarantees of free health-care provision with the reality of private health financing.   **Authors suggestions:**   * The role of strategic purchasing in working with powerful private sectors, the eﬀect of federal structures, and the implications of investment in primary health care as a foundation for UHC could be explored. |
| Singh et al([19](#_ENREF_19)). | 2013.  Report.  India. | **Challenges:**   * High disease prevalence. * Issues of gender equality. * Unregulated and fragmented health‑care delivery system. * Non‑availability of adequate skilled human resource. * Vast social determinants of health. * Inadequate finances. * lack of inter‑sectoral co‑ordination various political pull and push of different forces, and interests. |
| Mills et al([30](#_ENREF_30)). | 2012.  Report.  Ghana, South Africa  and Tanzania. | **Challenges:**   * The share of out-of-pocket payments in total health expenditure is high. * In the informal sector, people do not have the financial protection. * The current financing arrangements is fragmentation. * Allocate public health resources (both financial and human) is inequity.   **Authors suggestions:**   * Reduce the share of out-of-pocket payments in total health expenditure. * Provide financial protection to the population in the informal sector. * Reduce the fragmentation of current financing arrangements. * Allocate public health resources (both financial and human) more equitably |
| Ikegami et al([27](#_ENREF_27)). | 2012.  Report.  Japan. | **Challenges:**   * Aging society. * Changes in employment patterns. * Emerging issue of the uninsured. * Fragmentation of social health insurance.   **Authors suggestions:**   * Attainment of universal coverage on the one hand and achievement of equity in benefit packages and rates of co-payments and contributions on the other, are different goals and need different long-range strategies. * The importance of political driving forces to move countries forward on the path to universal coverage. |