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## Review

## Achieving sustainable development goals for HIV/AIDS in the Republic of the Congo – Progress, obstacles and challenges in HIV/AIDS health services

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## ABSTRACT

The HIV epidemic continues to be a major global public health issue. Since 2012, there has been a paucity of information from the Republic of the Congo on HIV incidence and prevalence rates, national HIV programme effectiveness, highly active antiretroviral therapy (HAART) rollout, patient adherence to treatment, operational and basic science research studies on HIV/AIDS, and donor funding and its impact on the country. A review of the existing literature on HIV in the Republic of the Congo was conducted, focused on prevalence trends, effectiveness of the current national HIV programme, HAART rollout, patient adherence to antiretrovirals (ARVs), resistance to ARVs, the cost of treatment, and operational issues affecting HIV/AIDS programmes in the country. In light of the findings, several important priority areas for scaling-up HIV/AIDS services, programmatic and research activities in the Republic of the Congo are highlighted.

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## Introduction

The HIV epidemic continues to be a major global public health issue. In 2017, there were 25.7 million men, women, and children living with HIV/AIDS in Sub-Saharan Africa, accounting for two-thirds of the global total of new HIV infections (UNAIDS, 2018). The Joint United Nations Programme on HIV/AIDS (UNAIDS) Fast-Track strategy aims to increase the HIV response in low- and middle-income countries to end the epidemic by 2030 (Sidibé et al., 2016). This will require country HIV programmes to detect and treat all people living with HIV/AIDS (PLWHA) with highly active antiretroviral therapy (HAART), so that the HIV viral load reduces to a level where the HIV-infected person is unlikely to transmit HIV to others, thus curtailing the transmission cycle (WHO, 2015). Current WHO figures estimate that in 2017 there were 17 million PLWHA who were receiving HAART worldwide (UNAIDS, 2018).

The Republic of the Congo (RoC) has a population of nearly five million, and life-expectancy at birth was 63 years in 2016. The Secrétariat Exécutif Permanent/Comité National de Lutte Contre le SIDA (SEP/CNLS) is responsible for coordinating the National HIV response. A notification system for HIV/AIDS cases does not exist in RoC, therefore there are no accurate and reliable epidemiological, clinical, and management outcomes data on HIV/AIDS. Data on HIV prevalence in RoC are scarce and come indirectly from small individual studies. The point prevalence of HIV infection in Pointe-Noire was 14% in 2000 and 5% in Brazzaville between 1996 and 2000. The HIV prevalence in sex workers was 34.3% in Brazzaville and 64.1% in Pointe-Noire (UNAIDS and WHO, 2004). In 2012, an HIV-related behavioural survey of sex workers, men who have sex with men (MSM), and prisoners in four locations across the country (Cuvette-Ouest, Plateaux, Pool, and Lékoumou), found HIV prevalence of 3.2% in the general population aged 15–49 years, which was slightly higher in urban (3.3%) than in rural areas (2.8%). The HIV prevalence among MSM was 26.1% and among sex workers was 7.5% (WHO Regional office for Africa, 2006). The HIV prevalence of 8.3% among prisoners was higher than in the general population (WHO Regional office for Africa, 2006).

Since 2012, there has been a paucity of information from RoC on HIV incidence and prevalence rates, national HIV programme effectiveness, HAART rollout, patient adherence to treatment, operational and basic science research studies on HIV/AIDS, and donor funding and its impact on the country. A review of the existing literature on HIV in RoC was therefore conducted, focused on the prevalence trends, effectiveness of the current national HIV programme, HAART rollout, patient adherence to ARVs, resistance to ARVs, the cost of treatment, and operational issues affecting HIV/AIDS programmes in the country. Several important priority areas for the public health response to HIV in RoC are discussed in light of the study findings.

## Methods

Reports and publications published in English and French were identified through a search of the PubMed database covering the period September 1, 1995–September 1, 2017 using the keywords ‘Congo’ or ‘Republic of Congo’ with the terms ‘HIV’ and ‘AIDS’ and combinations with ‘incidence’; ‘prevalence’; ‘HAART’; ‘ARV’; ‘rollout’; ‘treatment’; ‘toxicity’; ‘side effects’; ‘adherence’; ‘HIV

program’; ‘AIDS program’; ‘PLWHIV’; ‘HIV-infected’; ‘Sex workers’; ‘gender’; ‘donor’; ‘HIV research’; ‘AIDS research’; and ‘funding’. Search results that were found to be relevant to HIV in RoC and Africa were selected for this review. Other studies cited in articles identified in the searches that were relevant to HIV in Africa and RoC were also reviewed. Internal reports on HIV/AIDS published by RoC nationally; and reports by external agencies such as the WHO; UNAIDS; Unitaaid; and the Global Fund to Fight AIDS; Tuberculosis and Malaria (Global Fund) related to HIV/AIDS in Africa were also reviewed.

## Results

Eighty publications were identified through the search (Figure 1). Fifty-nine articles and publications that were not relevant to RoC were excluded. Furthermore, publications from the Democratic Republic of the Congo (DRC) were excluded, as DRC is a different country and appeared frequently in the search due to the similarity of names. A further five articles that mentioned RoC but were not relevant to HIV in RoC were also excluded. Thirteen publications were selected for the final analysis, of which eight were PubMed articles, three were RoC national reports, and 10 were reports from global health agencies such as the WHO, UNAIDS, UNITAID, and the Global Fund. This review of the literature confirmed the paucity of data on HIV in RoC. Of the 80 articles identified, there were only eight articles in the PubMed database and three RoC government reports relevant to HIV and HAART in RoC. The absence of an effective notification, data collection and reporting system for HIV/AIDS cases in RoC has led to a paucity of accurate and reliable epidemiological, clinical, and management outcomes data on HIV/AIDS.

## Discussion

In light of the paucity of data available in the literature, the discussion is focused on HIV prevalence trends, the effectiveness of the current national HIV programme, HAART rollout, patient adherence to ARVs, resistance to ARVs, the cost of treatment, and operational issues affecting HIV/AIDS programmes in RoC. The priority needs for further development of the national public health response to HIV, improving the quality and quantity of the cascade of HIV care, and taking forward current priorities for

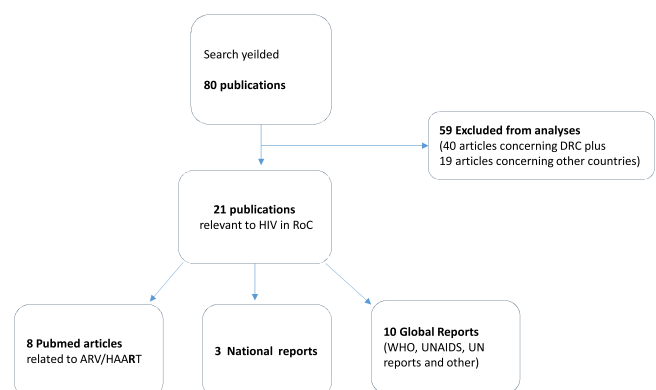


Figure 1. Flow chart of the literature search results.

strengthening of the HIV/AIDS programme in RoC are also discussed.

#### Development of the national public health response to HIV

In March 2006, RoC committed to the Brazzaville Commitment on scaling up towards universal access to HIV and AIDS prevention, treatment, care, and support in Africa by 2010 (WHO Regional office for Africa, 2006). This was formulated by the Continental Consultation on Scaling up towards Universal Access in Africa convened by the African Union (which represents 53 African Member States) with support from the WHO, UNAIDS, Economic Commission for Africa (ECA), and the UK Department for International Development (DFID) and with representatives from governments, parliaments, civil society, PLWHA, faith-based organizations, and the private sector from the 53 Member States of the African Union. An ambitious initiative for reducing the HIV/AIDS burden in RoC in 2008 recommended free healthcare for PLWHA, including diagnostic tests, HAART treatment, and follow-up (LNSP, 2012). In 2011, legislation called “Lutte contre le VIH et le SIDA, et pour la protection des droits des personnes vivant avec le VIH” was introduced to support healthcare for PLWHA to prevent recurrence of the frequent shortages of ARVs that occurred during the establishment of the Congolese Access to Antiretroviral Initiative between 2004 and late 2006.

From 2004 to 2005, a fee of between 6.68 USD and 66.80 USD was charged to the patient for HAART medicines, the exact amount depending on the patient’s socio-economic status (ONU, 2011). This was not affordable to many patients. Thus, as of 2006, through the Congolese Agency for Essential and Generic Medicine (COMEG), the government of RoC established a national programme of free access to ARVs, although patients had to pay laboratory costs for monitoring CD4+ T-cell counts and viral load measurements. This led to most patients not presenting for follow-up. Thus, accurate data on the effectiveness of ARVs among the PLWHA and the degree of development of HIV resistance to ARVs are not available. The Global Fund lent its support to RoC in 2012,

ensuring that HIV testing and HAART were provided free of charge to PLWHA across public health facilities throughout the country. Figure 2 shows the geographical distribution of HIV diagnostic and treatment centres in RoC. By the end of 2014, the Centre de Traitement Ambulatoire au Congo was providing care for 6430 PLWHA, including 5677 (88.3%) on HAART.

#### Cascade of care and management issues

##### Adherence

Adherence by patients to HAART is an important issue for HIV/AIDS services across Africa (Bekker et al., 2014). HIV/AIDS treatment requires several doses of ARVs every day, thus necessitating a reliable drug supply. Side-effects of ARVs can also prompt PLWHA to suspend or discontinue treatment (Bekker et al., 2014). An 18-month retrospective study conducted in Brazzaville of 157 patients on HAART for at least 12 months, showed that apart from the effectiveness of ARVs and despite observed therapy in 84% cases, 10.8% took their ARVs irregularly and 5.2% stopped altogether (Dokekias et al., 2008). A study of adherence and patient compliance conducted in RoC in 2009 involved a survey of 214 patients (mean age 42 years and only six children) at an outpatient care and treatment centre in Brazzaville, Congo (Faure et al., 2011), in which it was found that 92.5% of patients were receiving first-line HAART regimens and adherence rates achieved were between 55% and 87%. In a study that looked at causes of death in HIV-positive patients receiving ARVs at the French Red Cross Outpatient Treatment Centre at Pointe-Noire, RoC, one of several factors determined was non-adherence to treatment (Lucaccioni et al., 2013). Further operational research studies are required to define the main factors impeding adherence in order to inform on appropriate measures to improve adherence, such as public education or additional regular follow-up.

##### Optimizing and monitoring treatment

Monitoring of CD4+ cell counts and HIV viral load within RoC HIV services is extremely limited due to non-functioning

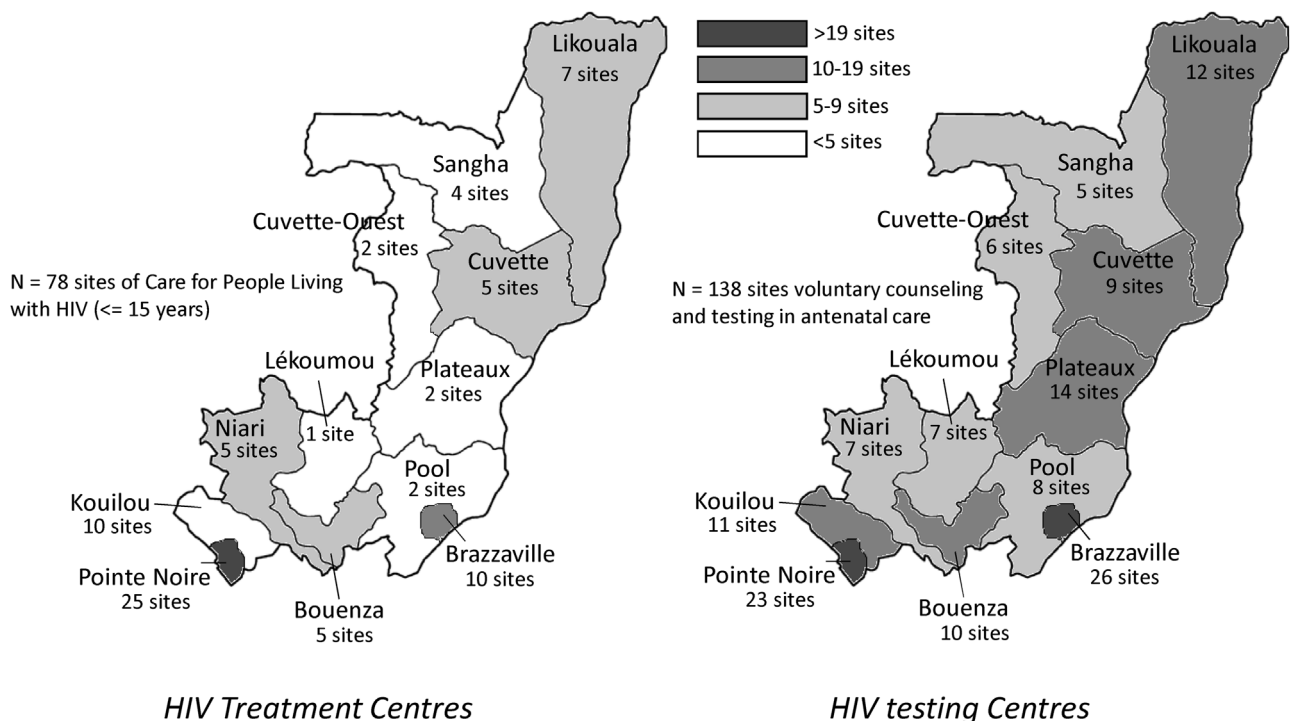


Figure 2. HIV testing and treatment centres in the Republic of the Congo.

equipment and the intermittent and scarce supply of reagents, causing substantial interruptions in the cascade of care. Due to the limited availability and choice of ARVs in RoC, it is difficult to tailor ARV therapy to the specific needs of the patient when they develop side effects or become intolerant. Furthermore, since genotyping of HIV isolates is not possible in RoC, the optimal choice of ARVs is also restricted (Beaulière et al., 2010). It is even more difficult to initiate a second- or third-line treatment regimen in the case of therapeutic failure due to the development of resistance to ARVs.

#### Resistance to ARVs

The emergence and transmission of HIV strains resistant to ARVs is now an important public health problem in RoC. In a study conducted in ARV-naïve HIV-infected patients reported in 2012, Pircher et al. (Pircher et al., 2012a) showed genetic diversity of HIV-1 and the presence of mutations conferring antiretroviral drug resistance in 50 drug-naïve infected persons in RoC. The most prevalent subtypes were G with 10 isolates and D with 11 isolates. Previous reports have shown the high genetic diversity in the distribution of HIV-1 subtypes in RoC. Subtypes A, G, and D predominate, but approximately 20–27% of strains circulating in the country are recombinants (Ekat, 2015; Church et al., 2015a) and 6.3% of strains remain unclassified. Pircher et al. concluded that the resistance to ARVs is the major cause of treatment failure (Pircher et al., 2012b).

The administration of poor quality ARVs in the country may also increase the risk of virus mutations conferring resistance to drugs (Camara et al., 2015). To prevent virological failure and the emergence of drug resistance mutations, the rigorous pharmacological monitoring of generic ARVs that are not pre-qualified by the WHO but that are marketed in Africa, must be a priority for health authorities (Camara et al., 2015).

In order to reduce the risk of the development of ARV resistance, appropriate measures should be taken to educate patients, simplify dosing, and enhance adherence monitoring. For example, a clear and adapted case-management model for the cascade of care from HIV counselling to healthcare could be applied. Operational research ascertaining the reasons for poor adherence should be at the front line for improving patient adherence, and patients who are at risk of becoming lost to follow-up should be identified proactively (Thompson et al., 2012; Beima-Sofie et al., 2017).

#### Mother-to-child HIV transmission

A study conducted in 44 selected antenatal clinics (ANCs) in 12 departments in RoC (five urban and seven rural) assessed 2979 pregnant women attending these facilities (Niama et al., 2017). The overall HIV infection rate was estimated to be 3.6%. This study indicated that more investment was required to emphasize prevention strategies to prevent mother-to-child and horizontal transmission of HIV. Maternal and child mortality and morbidity associated with HIV has been attributed to late HIV screening, the absence or delayed initiation of ARV therapy during pregnancy, and inadequate treatment for those with a detectable viral load in late pregnancy (Vogler, 2014). No data are available to assess the impact of this lack of optimization on maternal and child healthcare. The non-disclosure of the mother's HIV status to the father of the child, common in Africa including RoC, is associated with less optimal prevention of mother-to-child transmission, but has no impact on mother-to-child HIV transmission (Madiba, 2013).

Therapeutic failure among newly diagnosed mothers in RoC has been attributed to resistant HIV strains (Bruzzone et al., 2015). The study in Pointe-Noire analyzed 95 plasma samples from HIV-1-positive treatment-naïve pregnant women collected over a period

of 18 months between 2005 and 2008. Major mutations to nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and protease inhibitors were detected in 4/68 (5.9%), 3/68 (4.4%), and 2/68 (2.9%) of the patient samples, respectively. The extremely high genetic variability of viruses in RoC is an additional challenge, and justifies systematic monitoring of the response to treatment (Bruzzone et al., 2015); unfortunately this is not the case.

#### Co-trimoxazole prophylaxis

In Brazzaville, in accordance with WHO HIV treatment guidelines, co-trimoxazole prophylaxis (CTXp) for HIV-infected infants (from the age of 4 to 6 weeks) is administered irrespective of disease stage, CD4 cell count, or use of HAART until the age of 14 years (Church et al., 2015b). CTXp prevents bacterial infections and *Pneumocystis jirovecii* pneumonia in adults and children with HIV infection (Church et al., 2015b). CTXp also reduces anaemia and improves growth in children with HIV, possibly by reducing inflammation. Studies are required to ascertain the cost-effectiveness of CTXp in adolescents, particularly around reductions in morbidity and mortality, and improvements in growth, especially for children with HIV.

#### External funding for the HIV/AIDS programme in the Republic of the Congo

For the past decade, the Global Fund has provided substantial funding to RoC for HIV/AIDS, TB, and malaria services, amounting to an estimated 51 billion CFA francs (68 305 349 GBP). For the years 2014–2015, the Global Fund contributed a total of 16 156 313 Euros (14 195 548 GBP) to RoC (Global Fund, 2015), as follows: 6 233 128 Euros to the Secrétariat Exécutif du Conseil Nationale de Lutte Contre le SIDA (Executive Secretariat for the National HIV/AIDS Council), 7 093 150 Euros to the French Red Cross, and 2 830 035 Euros to the administrative and financial technical coordination of the Ministry of Public Health. This funding was part of the second phase of the project “Support to strengthen the national response to HIV among at-risk populations in the Congo”, which tackles socio-economic factors associated with HIV such stigma and marginalization. For the period 2017–2019, the Global Fund will contribute a total of 27 912 895 Euros, of which 11 539 955 Euros will be for HIV/AIDS activities. The International Monetary Fund funding for HIV/AIDS, malaria, and TB requires their contributions to be matched by 20% of the total by the host country. Currently, RoC is eligible to apply to the International Monetary Fund allocations for the years 2018–2020. Donor funding for the HIV response in low- and middle-income countries declined by almost 13% between 2014 and 2015 (UNAIDS and The Henry J Kaiser Family Foundation, 2016). Access to ARVs has no doubt dramatically reduced mortality and morbidity (Grace, 2016) and transformed the lives of PLWHA, returning them to a near-normal lifespan (Samji et al., 2013).

#### ARV supply chain and quality of drugs

The drug supply and rollout chain for free ARVs in RoC has suffered from many interruptions and issues of supply, quality, and expiry dates, and this has dogged the management of PLWHA (Agence d'information d'Afrique Centrale, 2013). Previously COMEG was responsible for the procurement of ARVs from foreign distributors, and the storage and distribution of these ARVs at the national level. Regarding the reagents for HIV testing and follow-up CD4+ cell counts and HIV viral load measurements, advanced payment by local structures was acceptable, with refunds from the

**Table 1**  
Priorities for scaling up HIV/AIDS programmatic activities in the Republic of the Congo<sup>a</sup>.

1. Observing respect for human rights; overcoming stigma and discrimination; advancing equity and gender-centred approaches; putting people (PLWHA, civil society groups, community) at the centre of the HIV and AIDS response.
2. Fostering and ensuring accountability (political, financial, moral, and programmatic) at every level of the response. This includes honest, transparent, and accountable use of donor funding.
3. Taking forward an unwavering commitment by the government of RoC to massively scale up and deliver a 'cost-free' comprehensive package of services for prevention, treatment, care, and support for HIV and AIDS.
4. Ensuring a regular and continuous supply of HIV diagnostics, ARVs, and laboratory reagents for CD4+ T-cell counts, HIV viral load measurement, and genotyping for resistance.
5. Establishing links between HIV services across all health sectors, including maternal and child health programmes.
6. Integrating TB and HIV care.
7. Increasing human resources by training and empowering all grades of healthcare workers, laboratory personnel, and community care staff.
8. Establishing effective collaborative regional and pan-African networks to accelerate priority research and training on HIV linked with TB, malaria, respiratory tract infections, and other co-morbidities.
9. Establishing an effective data management system with accurate reporting, record-keeping, and reporting to the WHO, allowing for more accurate data on prevalence, incidence, and trends.
10. Conducting priority operational, epidemiological, translational, clinical, and basic science research to fill data gaps and to inform patient adherence, ARV resistance, tailored ARV therapy, and surveillance.
11. Committing local governmental funds, increasing domestic resources, and weaning off dependency on external donor aid.

PLWHA, people living with HIV/AIDS; RoC, Republic of the Congo; ARVs, antiretrovirals; WHO, World Health Organization.

<sup>a</sup> Modified and adapted from the WHO Regional Office for Africa report (WHO Regional office for Africa, 2006).

Ministry of Public Health. The purchase of medicines has been funded by both the government of RoC and the Global Fund.

ARV procurement procedures are complex, particularly because of the multiplicity of donors involved in the field of antiretroviral drugs, with the procurement procedures being specific to each donor. The orders are not centralized and this often results in a breakdown of the drug supply chain (Libaudière et al., 2006), which is not well established in RoC. The Global Fund made two changes to allocations in 2013 (Anon, 2013): 1) funds allocated by the Global Fund could be used for the direct purchase of ARVs, and (2) ARVs were to be channelled through local NGOs for distribution to the beneficiaries. The health services in RoC have continued to face disruptions in drug supply for first- and second-line ARVs. As an example, in 2015 there was an acute shortage of Atripla, a combination pill consisting of efavirenz, emtricitabine, and tenofovir disoproxil fumarate. This error in supply chain disrupted the HAART treatment regimens of numerous patients, with a possible impact on the development of HIV viral resistance. Approximately 12% of the 18 000 patients who are on ARVs in RoC are taking Atripla. During shortages, some patients on Atripla are switched to other ARV regimens that are not optimal (Agence d'information d'Afrique Centrale, 2014). The latest drug supply shortage was recorded in March 2017, when there were an estimated 23 000 adults and over 1500 children on HAART. The HIV/AIDS Sustainability Index and Dashboard (Anon, 2016) is a tool used by the US donor agency PEPFAR (President's Emergency Plan for AIDS Relief) to determine a country's sustainability landscape for HIV/AIDS. This should be used to monitor funding and make available additional funds from the government to sustain the rising trajectory of rollout and access to antiretroviral therapy.

*Priorities for HIV/AIDS programme strengthening in the Republic of the Congo*

Table 1 lists priorities for the scale-up of HIV/AIDS programmatic activities in RoC (modified and adapted from a WHO report (WHO Regional office for Africa, 2006)). Observing respect for human rights, fighting stigma and discrimination, advancing equity and gender-centred approaches, and putting people (PLWHA, civil society groups, community) at the centre of the HIV and AIDS response is critical to its success. Taking forward an unwavering commitment by the government of RoC to massively scale up and deliver a 'cost-free' comprehensive package of services for prevention, treatment, care, and support for HIV and AIDS is required to get everyone diagnosed and treated.

Establishing links between HIV services across all health sectors, including maternal and child health programmes, and integrating TB and HIV care will provide a holistic approach to the management of patients (Linguissi et al., 2017).

The lack of data on HIV in RoC emphasized by this study makes an important case for establishing an effective data management system with accurate reporting, record-keeping, and reporting to the WHO, allowing for more accurate data on prevalence, incidence, and trends over time. The paucity of research publications from RoC makes the performance of operational and basic science research a priority. This is required to fill existing data gaps and provide an evidence base on patient adherence, ARV resistance, tailored ARV therapy, monitoring, follow-up, and surveillance. This will require increased political and financial commitments from the government of RoC and increased external donor funding.

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### Conflict of interest

The authors have no conflict of interest to declare.

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