Supplementary file 1:

Contextual Background Aruba

Supplement to:

Bracing for the next pandemic: Stakeholders and communities' perspectives on infectious disease risks and prevention on Aruba

Authors

Debby Pluijmert[1], Kimberly M. Grêaux[2], Judelca Briceno[3], Wilmer Salazar[3], Verenuska Rincon[3], Riem van den Berg[3], Nathalie Maduro[4], Anselmo Mathew[3], Eugene Maduro[3], Luis Chong[3], Clariene Croes[3], Esther Vermeulen[3,] Natalie V.S. Vinkeles Melchers[1]

Affiliations

1. Health & Society, Social Sciences Department, Wageningen University & Research, Hollandseweg 1, 6706 KN Wageningen, the Netherlands.
2. Faculty of Hospitality and Tourism Management Studies, University of Aruba, J. Irausquinplein 4, Oranjestad, Aruba.
3. Department of Public Health (DVG) Aruba, Caya Ing. R.H. Lacle 4, Oranjestad, Aruba.
4. Santa Rosa, Department of Agriculture, Livestock and Fishery, Piedra Plat 114-A, Paradera, Aruba.

Correspondence to:

Natalie V.S. Vinkeles Melchers, PhD. MSc. MPH.
Health & Society, Social Sciences Department, Wageningen University & Research, Wageningen, The Netherlands

Email: natalie.vinkelesmelchers@wur.nl

Table of Contents

1. Demographics

Aruba is located north of Venezuela and spans about 180 square kilometres (van Duyl et al., 2024). It is home to a registered population of 107,354 residents (2023) with a mix of backgrounds, originating from 140 countries and representing 97 nationalities (Central Bureau Statistics, 2024). Additionally, relative to its national populations, the island of Aruba hosts the largest number of refugees and other people in need of international protection. This is mainly because of the estimated 17.000 Venezuelans on the island (Central Bureau Statistics, 2023).

2. Political context

Aruba forms part of the Kingdom of the Netherlands and has exercised full internal autonomy since 1986, following its separation from the Dutch Antilles. It maintains its own constitution, independent legal framework, and a democratically chosen government. This government is responsible for delivering healthcare and public services, managing education and health sectors, and regulating local policy areas (Premdas, 1996).

Multiple stakeholder groups are involved in Aruba's health governance. Regarding the human health domain, key stakeholders include the Department of Public Health, the hospital, and general practitioners (Directie Volksgezondheid, 2025). These are actors involved in disease prevention, surveillance, health promotion, and responding to public health risks. Animal health falls under the Veterinary Service, which operates within the Department of Public Health. Its responsibilities include import and export control of live animals, veterinary public health measures, and the management of public abattoir, where ante-mortem and post-mortem inspections are conducted. Environmental health is managed by stakeholders with the Directorate of Nature and Environment, as the primary governmental body responsible for environmental regulation, monitoring, and enforcement (Directorate of Nature & Environment Aruba, 2025). Serlimar, Aruba's solid waste agency, is responsible for landfill and waste management (Governent of Aruba, 2025).

3. Health context

From the 1950s to the 1990s, Aruba had some of the best health outcomes in the Caribbean, with a strong increase in life expectancy during that period. However, since the mid-1990s, this progress has slowed down, yet life expectancy still increased by 0.18% in recent years (MacroTrends, 2025). This stagnation has been linked to the rise of non-communicable diseases. From 1999 to 2017, non-communicable diseases emerged as the primary causes of death on Aruba, responsible for 70% of mortality. The main contributors included heart disease, cancer, diabetes, and chronic respiratory illnesses (Deenstra et al., 2017; Pan American Health Organisation, 2024a). Risk factors such as obesity, physical inactivity, and an aging population play an important role (Pan American Health Organisation, 2024a, 2024b).

Regarding communicable diseases, Aruba faces a set of challenges, particularly due to its geographic location, climate, and population dynamics (Stewart-Ibarra et al., 2019; The Pandemic Fund, 2023). Zoonotic diseases, which are transmitted from animals to humans, represent a significant proportion of all emerging infectious diseases (Deiana et al., 2024; Skowron et al., 2023; Wikel, 2024). Vector-borne diseases such as Dengue, Chikungunya, and Zika pose notable risks due to the presence of competent mosquito vectors including Aedes aegypti (Duijster & Hahné, 2016). Aruba also reports cases of airborne illnesses such as COVID-19 and influenza. The risk of communicable disease outbreaks is compounded by Aruba's high volume of international travel and tourism, which facilitates pathogen introduction and rapid spread (Baker, 2015; Stewart-Ibarra et al., 2019).

4. Environment/ecosystem

The average daytime temperatures on Aruba typically stays around 30°C, with nights cooling to around 25°C. Rainfall on Aruba follows a seasonal pattern, with majority falling between October and January, and remains relatively low at approximately 400 to 500 millimetres annually. As a result, the island is predominantly dry, and extended periods of drought are not uncommon (Ridderstaat et al., 2014; Schmutz et al., 2017). Because of this, Aruba's natural landscape is dominated by drought-resistant plants like cacti, thorny bushes, and small tree species. The landscape is part of a xeric (dry) shrubland biome,

which means there is very little dense greenery or forested areas (Van Der Burg et al., 2012; Wege et al., 2010).

5. References

Baker, D. (2015). *Tourism and the health effects of infectious diseases: Are there potential risks for tourists? 12*, 3 [Available at: https://dialnet.unirioja.es/servlet/articulo?codigo=7986891&info=resumen&idioma=ENG].

Central Bureau Statistics. (2023). *Immigration to Aruba in the last 50 years – Central Bureau of Statistics* [Available at: https://cbs.aw/wp/index.php/2023/03/27/immigration-to-aruba-in-the-last-50-years/].

Central Bureau Statistics. (2024). *Population Projections – Central Bureau of Statistics* [Available at: https://cbs.aw/wp/index.php/2023/05/04/population-projections].

Deenstra, D., Wolvetang, N., Kock, S., Wills, S., Cobben, N., Wijnen, P., & Drent, M. (2017). Prevalence of interstitial and other lung diseases on Aruba. *Sarcoidosis, Vasculitis, and Diffuse Lung Diseases*, *34*(3), 217. https://doi.org/10.36141/SVDLD.V34I3.6038

Deiana, G., Arghittu, A., Dettori, M., & Castiglia, P. (2024). One World, One Health: Zoonotic Diseases, Parasitic Diseases, and Infectious Diseases. *Healthcare*, *12*(9), 922. https://doi.org/10.3390/healthcare12090922

Directie Volksgezondheid. (2025). *Organisacion | Directie Volksgezondheid*. [Available at: https://dvg.aw/pa/organisacion/].

Directorate of Nature & Environment Aruba. (2025). *About Us - Directorate of Nature & Environment* [Available at: https://dnm-aruba.org/en/about-us/].

Duijster, J., & Hahné, S. (2016). *Surveillanceoverzicht van zikavirus (ZIKV), dengue en chikungunya in Europees– en Caribisch Nederland en de overzeese Rijksdelen*. Vierwekelijks verslag –t/m week 44; 2016. Rijksinstituut voor Volksgezondheid en Milieu (RIVM); Ministerie van Volksgezondheid, Welzijn en Sport (VWS). RIVM-CIb-EPI-SIS [Available at: https://www.rivm.nl/sites/default/files/2018-11/Surveillance%20overzicht%20muggenoverdraagbare%20infectieziekten_tm%20week%2044%2C%202016.pdf].

Governent of Aruba. (2025). *Servicio di Limpieza di Aruba (Serlimar) | Overheid van Aruba* [Available at: https://www.gobierno.aw/nl/servicio-di-limpieza-di-aruba-serlimar-0].

MacroTrends. (2025). *Aruba Life Expectancy 1950-2025* [Available at: https://www.macrotrends.net/global-metrics/countries/ABW/aruba/life-expectancy].

Pan American Health Organisation. (2024a). *Aruba - Country Profile | Health in the Americas* [Available at: https://hia.paho.org/en/country-profiles/aruba].

Pan American Health Organisation (PAHO) (2024b). *STEPS Survey Results Presented in Aruba - Pan American Health Organization* [Available at: https://www.paho.org/en/news/10-6-2024-steps-survey-results-presented-aruba].

Premdas, R. R. (1996). *Ethnicity and Identity in the Caribbean: Decentering a Myth*. The Helen Kellogg Institute for International Studies. Working Paper #234 - December 1996 [Available at: https://kellogg.nd.edu/sites/default/files/old_files/documents/234.pdf].

Ridderstaat, J., Oduber, M., Croes, R., Nijkamp, P., & Martens, P. (2014). Impacts of seasonal patterns of climate on recurrent fluctuations in tourism demand: Evidence from Aruba. *Tourism Management*, *41*, 245–256. https://doi.org/10.1016/J.TOURMAN.2013.09.005

Schmutz, P., Potter, A., & Arnold Modlin Jr, E. (2017). *Aruba, Bonaire, and Curaçao*. 293–317. https://doi.org/10.1007/978-3-319-55787-8_18

Skowron, K., Grudlewska-Buda, K., & Khamesipour, F. (2023). Zoonoses and emerging pathogens. *BMC Microbiology*, *23*(1), 232. https://doi.org/10.1186/s12866-023-02984-w

Stewart-Ibarra, A. M., Romero, M., Hinds, A. Q. J., Lowe, R., Mahon, R., Van Meerbeeck, C. J., Rollock, L., Gittens-St. Hilaire, M., St. Ville, S., Ryan, S. J., Trotman, A. R., & Borbor-Cordova, M. J. (2019). Co-developing climate services for public health: Stakeholder needs and perceptions for the prevention and control of *Aedes*-transmitted diseases

in the Caribbean. *PLOS Neglected Tropical Diseases*, *13*(10), e0007772. https://doi.org/10.1371/journal.pntd.0007772

The Pandemic Fund. (2023). *Reducing the Public Health Impact of Pandemics through Strengthened Integrated Early Warning Surveillance, Laboratory Systems, and Workforce Development* [Available at: https://www.thepandemicfund.org/projects/CARIBBEAN-reducing-public-health-impact-pandemics-through-strengthened-integrated-early-warning].

Van Der Burg, W. J., De Freitas, J., Debrot, A. O., Lotz, L. A. P. (2012). *Invasive plants in the Dutch Caribbean*. Naturalised and invasive alien plant species in the Caribbean Netherlands: status, distribution, threats, priorities and recommendations. Report of a joint Imares/Carmabi/PRI project financed by the Dutch Ministry of Economic Affairs, Agriculture & Innovation. PRI report 437; mares report C185/11 [Available at: https://caribbeaninvasives.org/wp-content/uploads/2013/02/C185-11%20Invasive%20plants%20Dutch%20Caribbean.pdf].

van Duyl, F. C., Post, V. E. A., van Breukelen, B. M., Bense, V., Visser, P. M., Meesters, E. H., Koeniger, P., & Vermeij, M. J. A. (2024). Composition and distribution of the near-shore waters bordering the coral reefs of Aruba, Bonaire, and Curaçao in the Southern Caribbean. *Marine Pollution Bulletin*, *209*, 117297. https://doi.org/10.1016/J.MARPOLBUL.2024.117297

Wege, D. C., Ryan, D., Varty, N., Anadón-Irizarry, V., & Pérez-Leroux, A. (2010). Ecosystem profile: the Caribbean islands biodiversity hotspot. *BirdLife International in collaboration with Durrell Wildlife Conservation Trust / Bath University, The New York Botanical Garden; technical support by Conservation International-Center for Applied Biodiversity Science*. Critical Ecosystem Partnership Fund. Final version 15 January 2010 [Available at: https://www.biodiversite-martinique.fr/sites/default/files/the_caribbean_islands_biodiversity_hotspot_final_version_birdlife_international_2010_id_182148.pdf].

Wikel, S. K. (2024). Zoonoses: Changing, Challenging, and Increasing Global Disease Threats. *Zoonotic Diseases*, *4*(1), 8–10. https://doi.org/10.3390/zoonoticdis4010002