

The Netherlands' response to COVID-19 included measures at both regional and national levels. The Netherlands had pandemic preparedness tools in place prior to COVID-19. The Netherlands has a comprehensive pandemic response plan, which was a key plank in the country's preparedness toolkit. Coordinated by RIVM, it describes in detail the general actions to take in the case of an infectious disease crisis, including which measures should be taken in which phase of the crisis, and who is responsible for determining the crisis phase. (from State of Health in the EU · The Netherlands · Country Health Profile 2021 https://health.ec.europa.eu/system/files/2021-12/2021_chp_nl_english.pdf). Antibiotic consumption in the Netherlands is the lowest in Europe. Antimicrobial resistance (AMR) is a major public health concern in the EU, with estimates of approximately 35 000 deaths due to antibiotic-resistant infections and healthcare costs of around EUR 1.1 billion per year (OECD/ECDC, 2019). Because antibiotic overprescription and overuse in humans are major contributors to the development of antibiotic-resistant bacteria, antibiotic consumption data are a useful tool to evaluate the risk of AMR and the efficacy of programmes to promote their appropriate use. In this context, the Netherlands outperforms all other EU countries, boasting the lowest total antibiotic consumption rate in the EU in 2021. In the past five years, antibiotic consumption in the Netherlands decreased at an average rate of 3.8 % per year. This rate was only moderately slower than the EU average, despite the fact that the Netherlands' total antibiotic consumption was already less than half the EU average in 2016. This achievement reflects the country's longstanding commitment to enforcing stringent regulations and guidelines to curtail inappropriate prescribing. In 2021, antibiotic consumption in the Netherlands was 49 % below the EU average. This decline was primarily driven by prescriptions in community settings, which account for over 90 % of total antibiotic consumption. The COVID-19 pandemic played a significant role in reducing antibiotic consumption in the community, with the Netherlands experiencing a decline of over 12 % between 2019 and 2021. This decline is in large part attributed to pandemic containment measures resulting in fewer infections.

The [Dutch Recovery and Resilience Plan](#) will support development of national health data infrastructure in the coming years. The Dutch healthcare system is set to receive a funding boost in the upcoming years as part of the Netherlands' Recovery and Resilience Plan (RRP), a pivotal element of the EU's response to the COVID-19 crisis. Under its RRP, the Netherlands has allocated EUR 172 million to healthcare, representing around 4 % of its total grant allocation from the EU Recovery and Resilience Fund. Of these funds, over 40 % will be directed towards developing an integrated national health data (from State of Health in the EU · The Netherlands · Country Health Profile 2023 https://health.ec.europa.eu/system/files/2023-12/2023_chp_nl_english.pdf)

RIVM performs [sewage research](#) on infectious diseases, such as COVID-19, and non-infectious diseases. RIVM performs [SARS-CoV-2 pathogen surveillance](#) (from <https://www.infectious-diseases-toolkit.org/national-resources/netherlands>). A surveillance and early warning system for Avian Influenza in the Netherlands has been set up to limit the spread of the virus.

Research & Innovation for Pandemic Preparedness Policies and Strategies *The information is not exhaustive and should be updated regularly*

Country has a dedicated strategy for R&I for PP

Yes (various actors)

Ministry of Health information (in Dutch)

a. Letter from the minister of Health to the parliament 14 April 2022.

<https://www.rijksoverheid.nl/documenten/kamerstukken/2022/04/14/kamerbrief-over-beleidsagenda-pandemische-paraatheid>

b. Letter from the minister of Health to the parliament 4 November 2022. <https://open.overheid.nl/repository/ronl-5dc159a4869495958c60a5f72229de0522fccda9/1/pdf/kamerbrief-over-beleidsprogramma-pandemische-paraatheid.pdf> .

News about this letter: <https://www.rijksoverheid.nl/actueel/nieuws/2022/11/04/versterking-pandemische-paraatheid-op-koers>

c. News about investment from the Netherlands in CEPI and FIF-PPR:

<https://www.rijksoverheid.nl/actueel/nieuws/2022/10/27/nederland-investeert-in-internationale-pandemische-paraatheid>

d. National actionplan strengthening zoonoses policy:

<https://www.rijksoverheid.nl/documenten/rapporten/2022/07/06/nationaal-actieplan-versterken-zoonosenbeleid>

e. Report of expertgroup zoonoses with recommendations to reduce risks on future zoonotic outbreaks:

<https://www.rijksoverheid.nl/documenten/rapporten/2021/06/01/rapport-expertgroep-zoonosen> (includes research recommendations)

f. Societal Impact Team:

The Societal Impact Team (MIT) advises the cabinet on the societal consequences of pandemics and how to deal with them, such as the corona pandemic and corona measures

<https://www.rijksoverheid.nl/ministeries/ministerie-van-sociale-zaken-en-werkgelegenheid/organisatie/commissies/mit> and work programme 2022-2024: (<https://open.overheid.nl/repository/ronl-9230c944c772cd16399234694e8b095a1fcd2f38/1/pdf/werkprogramma-maatschappelijk-impact-team-2022-2024.pdf>)

2. Ministry of Health information (in English)

Ministry of Health Global Health Strategy, including some info on pandemic preparedness, in English.

<https://www.government.nl/ministries/ministry-of-health-welfare-and-sport/documents/publications/2022/10/21/dutch-global-health-strategy-2023-2030>

3. ZonMw, the Netherlands Health Research Organisation: (in Dutch)

a. Overview of what ZonMw does on pandemic preparedness: <https://www.zonmw.nl/nl/pandemische-paraatheid>

b. Knowledge programme on pandemic preparedness: <https://www.zonmw.nl/nl/programma/kennisprogramma-pandemische-paraatheid>

c. BEhavioural and social sciences and pandemic PREPAREDness: the BePrepared Consortium

<https://projecten.zonmw.nl/nl/project/behavioural-and-social-sciences-and-pandemic-preparedness-beprepared-consortium>

4. RIVM, the Dutch National Institute for Public Health and the Environment (in English):

a. Overview of what RIVM does on pandemic preparedness: <https://www.rivm.nl/en/infectious-disease-control/strengthening-infectious-disease-control-pandemic-preparedness>.

b. National Functionality for Upscaling Infectious Disease Control (LFI): <https://www.rivm.nl/en/lfi>

c. International collaboration: <https://www.rivm.nl/en/infectious-disease-control/international-collaboration>

5. Large University initiatives and collaborations:

a. **Pandemic and Disaster Preparedness Centre** (PDPC, collaboration of 2 universities, in collaboration with WHO, VEO and Netherlands Centre for One Health): PDPC publishes pandemic research agenda <https://convergence.nl/pdpc-publishes-pandemic-research-agenda/>

b. **ERRAZE**: research and investment framework of Wageningen University: ERRAZE@WUR: being prepared for new pandemics <https://www.wur.nl/en/Research-Results/Research-programmes/Cross-WUR-programmes/ERRAZE-at-WUR.htm>

c. **TNO**, The Dutch Organisation for Applied Scientific Research, is an independent research organisation. In collaboration with the Dutch Ministry of health, universities and knowledge institutes, TNO's working on a research programme called: *Pandemic Preparedness and Ventilation Research Program: P3Venti* (<https://www.tno.nl/nl/duurzaam/veilige-duurzame-leefomgeving/bouwinnovatie/bouwen-veilig-efficient-zorggebouw/ventilatie-aerogene-transmissie-virussen/>)

d. **Netherlands Centre for One Health (NCOH)** brings together academic research institutes in the Netherlands that are active in One Health research together with other leading parties to forge an open innovation network with the capacity to take joint responsibility for finding answers to global One Health challenges (<https://ncoh.nl/>)

e. **Be-Prepared** aims to provide in-depth analyses of mixed-method behavioural science data collected throughout the unprecedented COVID-19 pandemic and inform preparedness strategies for future outbreaks. You can find more information on their website: [THE BE-PREPARED CONSORTIUM | Behavioural Science for Pandemic Preparedness | Home](#)

Country has an open science portal with information on publicly financed scientific research?

Yes <https://www.zonmw.nl/en/>

R&I portal <https://www.nwo.nl/projecten>

Country has R&I webpage on COVID-19; MPox; Other WHO viral risks; Antimicrobial resistance (AMR); Chemical, Biological, Radiological and Nuclear (CBRN) threats

Website open science/ open data initiative with respect to pandemic threats, such as COVID-19 open

Name	URL
Overview of AMR surveillance studies	https://www.rivm.nl/en/antimicrobial-resistance/overview-of-amr-surveillance-studies
Mpox infections	https://www.rivm.nl/en/mpox
COVID-19	https://www.rivm.nl/en/coronavirus-covid-19
ZonMW COVID-19 Programme	https://projecten.zonmw.nl/nl/project/programma-covid-19
NWO open science policy	https://www.nwo.nl/en/open-science
Overview of research on Arboviruses	https://www.rivm.nl/en/arboviruses/research-projects-arboviruses
Overview of research on COVID-19 by RIVM	https://www.rivm.nl/en/coronavirus-covid-19/research
WHO collaborating Centre for preparedness and response for laboratory high threat pathogens and biorisk	https://www.rivm.nl/en/who-collaborating-centre-laboratory-preparedness-and-response-for-high-threat-pathogens-and-biorisk
CBRN preparedness & response	https://www.rivm.nl/en/global-health-security/cbrn-preparedness-response
Infectious diseases toolkit The Netherlands	https://www.infectious-diseases-toolkit.org/national-resources/netherlands
Country has coordinating structures to link public health needs and research needs?	ZonMW https://www.zonmw.nl/en/ & RIVM https://www.rivm.nl/en Outbreak Management Teams https://www.rivm.nl/coronavirus-covid-19/omt and Expert Meetings (Deskundigenberaden)

R&I Infrastructures, Initiatives and Clinical Trials The information is not exhaustive and should be updated regularly

Country has the following research infrastructure for infectious diseases and outbreaks available, or under construction

BSL 3; Clinical trial units; High level isolation units; Reference centres of excellence; Emergency intervention units; Open genome deposits for viruses; Other

Name Infrastructure	Type Infrastructure	URL	Max Capacity	Available for	Open to
all university medical centres	clinical trial units and high level isolation units	https://www.nfu.nl/		Academia	Yes
Corona dashboard	other	https://www.coviddashboard.nl/		Government	
COVID-19 open data	other	RIVM data		RIVM	Yes
Environmental Assessment Unit	Emergency Intervention unit	https://www.rivm.nl/en/eau		RIVM	
Erasmus MC, department of Viroscience	Academic Medical Centre	https://www.erasmusmc.nl/en/research/departments/viroscience		Academia	Yes
EVAg	Open genome deposit for viruses	https://www.european-virus-archive.com/			
Infectious Diseases Surveillance Information System Antibiotic Resistance	other	https://www.rivm.nl/isis-ar		RIVM	
Influenza data	other	https://www.rivm.nl/griep-grieprik/feiten-en-cijfers		RIVM	
ISBE.NL Infrastructure for Systems Biology Europe Netherlands	Understanding and modelling COVID-19 epidemics	http://isbe.nl/			

Pienter Corona research	other	https://www.rivm.nl/pienter-corona-onderzoek/resultaten		RIVM	
Reference Laboratories	Reference centres of excellence	https://www.rivm.nl/infectieziektebestrijding/diagnostiek/netwerk-referentielaboratoria		RIVM/academia	Yes
RIVM	BSL3 and reference centre	www.rivm.nl		Other	Yes
RIVM/CIB	National Institute for Public Health and the Environment, Centre for Infectious Disease Control	https://www.rivm.nl/en	550 fte	RIVM	
SARS-CoV-2 variants	other	https://www.rivm.nl/en/coronavirus-covid-19/current/variants		RIVM	
SeqNeth	other	https://seqneth.nl/		RIVM / academia	
Type-Ned	other	https://www.rivm.nl/type-ned		RIVM	Yes
Virological weekly reports	other	https://www.rivm.nl/virologisc		RIVM	
Wastewater surveillance for COVID-19 and other pathogens	other	https://www.rivm.nl/en/wastewater-research		RIVM	
WHO Collaborating Centres	Reference centres of excellence	https://www.rivm.nl/en/who-collaborating-centres		RIVM	
WUR	centre of excellence	https://www.wur.nl/en/article/erraze-at-wur-1.htm		Academia	Yes

Country supporting the participation to the following ESFRI initiatives relevant for infectious diseases

BBMRI; EATRIS; ECRIN; ERINHA; MIRRI

Website network of clinical trials (e.g. to facilitate the access to clinical trials) the country is involved in

<https://www.remapcap.org/>
<https://www.ecraid.eu/>
<https://www.edctp.org/>
<https://www.combacte.com/>
<https://vaccelerate.eu/>
<https://www.recover-europe.eu/>

Budget mobilisation mechanisms and funding sources *The information is not exhaustive and should be updated regularly*

Basic Research

url www.nwo.nl
<https://www.rivm.nl/en>
funding for basic research accessible for industry?
source of funding Public (research) agencies

Applied Research

url www.nwo.nl
<https://www.rivm.nl/en>
www.zonmw.nl e.g. <https://www.zonmw.nl/en/program/infectious-disease-control-3-2019-2023>
funding for applied research accessible for industry?
source of funding Public (research) agencies

Translational Research

url www.nwo.nl
<https://www.rivm.nl/en>
www.zonmw.nl
funding accessible for industry?
source of funding Public (research) agencies

Clinical Research (in general)

url www.nwo.nl
<https://www.rivm.nl/en>
www.zonmw.nl
funding accessible for industry?
source of funding Public (research) agencies

Clinical Research (in pandemic phase)

url www.nwo.nl
<https://www.rivm.nl/en>
www.zonmw.nl
accessible for industry?
source of funding Public (research) agencies

Innovation Projects

url www.nwo.nl
www.zonmw.nl
www.rvo.nl
<https://www.rivm.nl/en/about-rivm/strategic-programme-rivm>
- **RVO (Rijksdienst voor Ondernemend Nederland)**: A governmental service providing information, advice and financing in the field of sustainable, agricultural, innovative and international entrepreneurship.
- **The National Growth Fund (NGF)** is a 20 billion euro's investment of the Dutch government in projects (between 2021 and 2025) that ensure long-term economic growth. Projects funded by the NGF are, for example, **Health-RI** (The Health-RI project is working on a health data infrastructure for bundling, sharing and reusing Dutch knowledge in the field of health: <https://www.health-ri.nl/>) and **Pharma-NL** (an initiative to accelerate the transfer of therapies from lab to patient <https://www.pharma-nl.com/>)
- **The Dutch Life Sciences & Health (LSH or 'Health~Holland')**. Under the guidance of LSH/Health~Holland public and private partners combine their investments and activities nationally to gain economic and societal impact for Health & Care, one of the four challenges of the Dutch government's Mission-driven Innovation Policy (<https://www.health-holland.com/>)

Flexible funding during emergencies possible

R&I actors, authorities and activated processes that are activated in case of a health threat *The information is not exhaustive and should be updated regularly*

R&I actors, authorities and

ministries involved in case of an outbreak; mobilisation processes of research forces; (existing) national or regional structures that advise governments on R&I during emergencies; administrative procedures to diminish the administrative burden for researchers and funding administrations; assessment of research outputs produced during a crisis; incentives ensuring qualitative scientific dissemination during a crisis; international scientific collaboration in case of an outbreak

Name	Description	url
Netherlands Centre for One Health (NCOH)	Netherlands Centre for One Health (NCOH) brings together academic research institutes in the Netherlands that are active in One Health research together with other leading parties to forge an open innovation network with the capacity to take joint responsibility for finding answers to global One Health challenges	https://ncoh.nl/
Deskundigenberaad (Expert Meeting)	Even if there are no acute threats, there may be a need for advice from experts, for example in emerging resistant pathogens. The request for advice can come from the Clb, other experts or from the ministries as a result of misunderstood or unclear signals. An expert meeting (DB) gives space to state the state of science on a specific topic and analyze and generate research questions.	https://www.rivm.nl/sites/default/files/2020-05/Folder%20landelijke%20advisering%20bij%20infectieziektedreigingen%20en%20crises_0.pdf
Dutch Life Sciences & Health (LSH or 'Health~Holland')	The Dutch Life Sciences & Health (LSH or 'Health~Holland'). Under the guidance of LSH/Health~Holland public and private partners combine their investments and activities nationally to gain economic and societal impact for Health & Care, one of the four challenges of the Dutch government's Mission-driven Innovation Policy	https://www.health-holland.com/
Dutch Research Council - NWO		www.nwo.nl
Erasmus MC	The Department of Viroscience of Erasmus University Hospital in Rotterdam is WHO Collaborating Center for Arboviral and Zoonotic diseases preparedness research and reference	https://www.erasmusmc.nl/en/research/groups/viroscience-collaborating-centre-for-arbovirus-and-haemorrhagic-fever-ref-research
Health Council of the Netherlands	The Health Council of the Netherlands is an independent scientific advisory body whose legal task it is to advise the Dutch ministers and Parliament in the field of public health and health/healthcare research.	https://www.healthcouncil.nl/
KWR Watercycle Research Institute	KWR Watercycle Research Institute is WHO Collaborating Centre on Water Quality and Health	http://www.kwrwater.nl
Maatschappelijk Impact Team	The Societal Impact Team (MIT) advises the cabinet on the societal consequences of pandemics and how to deal with them, such as the corona pandemic and corona measures. The MIT provides solicited and unsolicited advice to the cabinet.	https://www.rijksoverheid.nl/ministeries/ministerie-van-sociale-zaken-en-werkgelegenheid/organisatie/commissies/mit
Ministry of Health		https://www.government.nl/ministries/ministry-of-health-welfare-and-sport
Ministry of Justice and Security	plays a role in case of health crisis	https://www.government.nl/ministries/ministry-of-justice-and-security
NGF - National Growth Fund	The National Growth Fund (NGF) is a 20 billion euro's investment of the Dutch government in projects (between 2021 and 2025) that ensure long-term economic growth. Projects funded by the NGF are, for example, Health-RI (The Health-RI project is working on a health data infrastructure for bundling, sharing and reusing Dutch	

knowledge in the field of health: <https://www.health-ri.nl/>) and Pharma-NL (an initiative to accelerate the transfer of therapies from lab to patient <https://www.pharma-nl.com/>)

Outbreak Management Team	In the event of a major outbreak of an infectious disease or an international threat, the RIVM may convene an Outbreak Management Team (OMT) which advises the Prime Minister and the Cabinet on necessary measures, and consists of medical specialists, virologists, medical microbiologists and representatives of the national reference laboratory.	https://www.rivm.nl/coronavirus-covid-19/omt
RIVM - incl Expert Meeting (Deskundigenberaad)	RIVM, the Dutch National Institute for Public Health and the Environment, works towards a healthy population living in a sustainable, safe and healthy environment. RIVM pursues those goals based on independent scientific research. Working with our commissioning clients, we identify the research that is needed and conduct studies accordingly. We provide advice to the government, to professionals and to members of the public, and share our knowledge.	http://www.rivm.nl/en
RVO - Rijksdienst voor Ondernemend Nederland	A governmental service providing information, advice and financing in the field of sustainable, agricultural, innovative and international entrepreneurship	https://www.rvo.nl/
Signaleringsoverleg	National structure to advise government during emergencies Every Thursday, infectious disease signals from the Netherlands and abroad are discussed during the Signaling Consultation at RIVM. Signals can be, for example, outbreaks, new or unexpected infectious diseases or trends. The signals are used to take control measures where necessary to prevent further spread, or to advise on further research on the signals	https://www.rivm.nl/surveillance-van-infectieziekten/signalering-infectieziekten
The Centre for Infectious Disease Control (RIVM-CIb)	The Centre for Infectious Disease Control (RIVM-CIb) plays an advisory and coordinating role in the control of infectious diseases in the Netherlands.	https://www.rivm.nl/over-het-rivm/organisatie/centrum-infectieziektebestrijding
TNO	TNO, The Dutch Organisation for Applied Scientific Research, is an independent research organisation. In collaboration with the Dutch Ministry of health, universities and knowledge institutes, TNO's working on a research programme called: Pandemic Preparedness and Ventilation Research Program: P3Venti	https://www.tno.nl/en/
Utrecht University	The Department of Biomolecular Health Sciences - Infectious Diseases and Immunology of the Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands is designated by the World Health Organization as WHO Collaborating Centre (CC) for Reference and Research on Campylobacter and Antimicrobial Resistance from a One Health Perspective.	https://www.uu.nl/en/organisation/faculty-of-veterinary-medicine/research/research-centres-facilities/who-collaborating-centre-for-campylobacter
ZonMw	ZonMw stimulates health research and care innovation throughout the entire knowledge chain from fundamental research to implementation.	www.zonmw.nl

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BE READY is responding to the call: HORIZON-HLTH-2021-DISEASE-04-06 "Building a European partnership for pandemic preparedness" under grant agreement 101057795. Starting date: 01.06.2022. | End Date 31.05.2025

BE READY PLUS is responding to the call: HORIZON-HLTH-2024-DISEASE-17 "Pandemic preparedness and response: Maintaining and enhancing the preparatory work for a co-funded European partnership for pandemic" under grant agreement 101195079. Starting date: 01.01.2025. | End Date 31.12.2025

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