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Report No: PADHI00266

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF EUR 230.1MILLION
(US$ 250 MILLION EQUIVALENT)

TO THE

REPUBLIC OF TÜRKİYE

FOR A

TÜRKİYE PREPAREDNESS FOR PUBLIC HEALTH EMERGENCIES PROJECT
(P180781)

NOVEMBER 11, 2024

Health, Nutrition & Population
Europe And Central Asia

CURRENCY EQUIVALENTS

(EXCHANGE RATE EFFECTIVE OCTOBER 31, 2024)

Currency Unit =	Turkish Lira (TRY)
EUR 0.92017 =	US$1
TRY 34.25 =	US$1
US$0.03 =	TRY 1

FISCAL YEAR
JANUARY 1 - DECEMBER 31

Regional Vice President:	Antonella Bassani
Regional Director:	Michal J. Rutkowski
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Task Team Leader:	Nadwa Rafeh

ABBREVIATIONS AND ACRONYMS

AM	Accountability Mechanism
AMR	Antimicrobial Resistance
CERC	Contingent Emergency Response Component
CPF	Country Partnership Framework
ECDC	European Center for Disease Prevention and Control
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessment
EWS	Early Warning System
FM	Financial Management
GBV	Gender Based Violence
GD	General Directorate
GDP	Gross Domestic Product
GHG	Green House Gas
GM	Grievance Mechanisms
GRS	Grievance Redress Service
HEPPR	Health Emergency Prevention, Preparedness and Response
HIS	Health Information System
HSSSP	Health Systems Strengthening and Support Project
HTP	Health Transformation Program
IFR	Interim Financial Report
IPF	Investment Project Financing
MoH	Ministry of Health
NCD	Non-Communicable Disease
NRA	National Regulatory Authority
OH	One Health
PDO	Project Development Objective
PHE	Public Health Emergency
PMSU	Project Management Support Unit
POM	Project Operations Manual
PPR	Pandemic Preparedness and Response
ROI	Return on Investment
SEUM	Simulation Based Training Center *(Simülasyon Destekli Eğitim ve Uygulama Merkezi)*
STEP	Systematic Tracking of Exchanges in Procurement
TERRP	Türkiye Earthquake Recovery and Reconstruction Project
TMMDA	Turkish Medicines and Medical Devices Agency
VPC	Vaccine Production Center
WHO	World Health Organization

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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Turkiye	Türkiye Preparedness for Public Health Emergencies Project		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P180781	Investment Project Financing (IPF)	Substantial	

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternative Procurement Arrangements (APA)	[ ] Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
05-Dec-2024	31-Oct-2029
Bank/IFC Collaboration	
No	

Proposed Development Objective(s)

The Project Development Objective is to strengthen Türkiye's capacity to (i) produce vaccines, and (ii) detect and initiate a rapid response to public health emergencies.

Components

Component Name	Cost (US$)
Strengthen vaccine production capacity	150.00

Strengthen national and subnational capacities for detection of and response to health emergencies	92.00
Project management and monitoring, and institutional capacity	8.00
Contingent emergency response	0.00

Organizations

Borrower:	Republic of Turkiye		
Contact	Title	Telephone No.	Email
Kerem Dönmez	Director General of Foreign Economic Relations, Ministry of Treasury and Finance	903122047357	kerem.donmez@hmb.gov.tr
Implementing Agency:	Ministry of Health		
Contact	Title	Telephone No.	Email
Zahide Şenalp	Project Director	903124718500	zahide.senalp@saglik.gov.tr

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)? No

Is this project Private Capital Enabling (PCE)? No

SUMMARY

Total Operation Cost	**250.00**
Total Financing	**250.00**
of which IBRD/IDA	**250.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	250.00

Expected Disbursements (US$, Millions)

WB Fiscal Year	2025	2026	2027	2028	2029	2030
Annual	13.90	19.19	22.92	44.32	85.48	64.19
Cumulative	13.90	33.09	56.01	100.33	185.81	250.00

PRACTICE AREA(S)

Practice Area (Lead)

Health, Nutrition & Population

Contributing Practice Areas

CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Overall	Substantial

POLICY COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description
Schedule 2 to the Loan Agreement - The Borrower shall carry out the Project in accordance with the Implementation Arrangements set out in Section I, Schedule 2 of the Loan Agreement.
Paragraph 1 of Section IV of Schedule 2 to the Loan Agreement: No later than eighteen (18) months after the Effective Date, and as soon as they are available, the Borrower, through MoH, shall furnish to the Bank, the designs of the Ankara Vaccine Production Center.
Paragraph 2 of Section IV of Schedule 2 to the Loan Agreement: No later than three (3) months after the Ankara Vaccine Production Center draft designs are available as per paragraph 1. above, the Borrower, through MoH, shall retain an independent biosafety expert with qualifications and terms of reference acceptable to the Bank, to assess the designs of the Ankara Vaccine Production Center, including the biosafety risks and appropriateness of the kindergarten location and design as part of said facility.
Paragraph 3 of Section IV of Schedule 2 to the Loan Agreement: No Eligible Medical and Technical Equipment procured under Part 1.1.(a) of the Project shall be installed in the Ankara Vaccine Production Center unless and until (i) the Bank is satisfied that the Ankara Vaccine Production Center has been designed in compliance with the assessment and recommendations of the biosafety expert referred to in 1. above; and (ii) the Bank is satisfied that the Ankara Vaccine Production Center designs and construction meets the requirements and criteria set forth in the ESCP and the environmental and social instruments referred to therein.
Paragraph 4 of Section IV of Schedule 2 to the Loan Agreement: The Borrower, through MoH, shall ensure that, throughout the life of the Project, the Ankara Vaccine Production Center maintains its operation certification issued by the NRA and as specified in the Ankara VPC ESIA/ESMP.
Paragraph 5 of Section IV of Schedule 2 to the Loan Agreement: The Borrower, through MoH, shall ensure that the Ankara Vaccine Production Center is constructed and said construction maintained, throughout Project implementation, in compliance with (i) the assessment and recommendations of the biosafety expert referred to in 1. above; and (ii) the requirements and criteria set forth in the ESCP and the environmental and social instruments referred to therein.
Paragraph 6 of Section IV of Schedule 2 to the Loan Agreement: Upon completion of the construction of the Ankara Vaccine Production Center, the Borrower, through MoH, shall retain a biosafety expert to assess and confirm that the construction of the Ankara Vaccine Production Center has finalized and is in compliance with the assessment and recommendations of the biosafety expert referred to in 1. above.

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Article 4.01 (a) of the Loan Agreement	The Borrower, through MoH, has prepared and adopted the Project Operations Manual ("POM") in form and substance acceptable to the Bank.	IBRD/IDA
Effectiveness	Article 4.01 (b) of the Loan Agreement	The Borrower, through MoH, has hired one (1)	IBRD/IDA

		environmental specialist and one (1) social specialist for the MoH PMSU referred to in Section I.A.1(b) of Schedule 2 of the Loan Agreement.	
Disbursement	Section III.B. 1.(b) of Schedule 2 to the Loan Agreement	No withdrawal shall be made for Emergency Expenditures under Category (2), unless and until all of the following conditions have been met in respect of said expenditures: (i) (A) the Borrower has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Bank a request to withdraw Loan amounts under Category (2); and (B) the Bank has agreed with such determination, accepted said request and notified the Borrower thereof; and (ii) the Borrower, through MoH, has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Bank.	IBRD/IDA

I. STRATEGIC CONTEXT

A. Country Context

1. **Türkiye is vulnerable to a range of hazards that pose risks to human health and economic activity.** Direct impacts from the COVID-19 pandemic in Türkiye were severe, with over 17 million cumulative confirmed cases and over 100,000 confirmed deaths.[1]. Further excess death and morbidity caused by missed continuity of essential health services and other indirect health impacts were equally high and will continue to have downstream effects. While Türkiye successfully mobilized health resources in some areas, the pandemic underscored the critical need for coordinated action against major public health emergencies (PHEs).[2] Türkiye pursued an economic strategy that allowed it to withstand some of the financial pressures of the pandemic, however, the direct annual medical cost of COVID-19 in 2020 still resulted in a burden that corresponds to two percent of government health expenditures and 0.08 percent of Gross Domestic Product (GDP).[3]

2. **More recently, the devastating earthquakes in February 2023 also had a considerable impact on the health and well-being of the population**. Over 50,000 casualties and 107,000 injuries were reported, and an additional 3.3 million people were displaced. Healthcare and service delivery capacity were significantly damaged and the ability to carry out critical public health functions, such as surveillance and laboratory testing, was adversely affected. This led to increased exposure to infectious diseases. For example, changes in environmental conditions as a result of the 2023 earthquakes resulted in the destruction of clean water and sewage systems and significantly increased the risk of infectious disease outbreaks. [4,5]

3. **The impacts of climate change further escalate Türkiye's susceptibility to PHEs, with rising risk of climate-related natural hazards and downstream impacts of climate as a driver of outbreaks and biological hazards.** Recent national climate projections indicate rising temperatures, increased acute intensive precipitation events, and decreased total precipitation. These factors underlie the country's growing exposure to natural hazards including flooding, droughts, and wildfires, which make it vulnerable to increasingly severe and potentially overlapping emergencies. These climate impacts are anticipated to lead to a 2.26 percent loss in GDP by 2050, which is expected to grow to a 7.98 percent loss by 2100.[6]

4. **Gender dynamics also impact the way people are affected by PHEs and disasters, as well as their capacity to withstand and recover from them.** Studies around the world have shown that disasters disproportionately affect women and girls, who are at greater risk of violence and exploitation in the face of disrupted access to services, food, relief, supplies, and

[1] https://covid19.saglik.gov.tr/
[2] Public Health Emergency: Any acute event that may have negative consequences for human health, impacts the lives and well-being of a large number of people or a significant percentage of a population, and requires substantial multisectoral assistance (WHO, Emergency Response Framework). This definition leverages an 'all-hazards' approach and covers events occurring irrespective of their origin or sources (e.g. biological, natural, chemical, etc.).
[3] Oksuz, E., Simten Malhan, Mustafa Sait Gonen, Zekayi Kutlubay, Yilmaz Keskindemirci, Fehmi Tabak. 2021. "COVID-19 healthcare cost and length of hospital stay in Türkiye: Retrospective analysis from the first peak of the pandemic." *Health Economics Review* 11(1): 39. https://doi.org/10.1186/s13561-021-00338-8
[4] https://www.sbb.gov.tr/wp-content/uploads/2023/03/2023-Kahramanmaras-ve-Hatay-Depremleri-Raporu.pdf.
[5] https://iris.who.int/bitstream/handle/10665/366346/WHO-EURO-2023-7145-46911-68571-eng.pdf.
[6] G20 CLIMATE RISK ATLAS: Impacts, policy, economics: Türkiye. https://files.cmcc.it/g20climaterisks/Turkey.pdf.

latrines.[7, 8 9] To mitigate the adverse effects of disasters on women and girls, it is important for Türkiye to have a comprehensive national all-hazards health emergency preparedness plan that includes specific protocols for responding to GBV during emergencies. Improving the existing gaps is important, given the increased vulnerability to GBV during and after disasters. International agreements, laws, and policy commitments to combat violence against women and girls call for strengthening implementation [10] particularly in emergencies. During a PHE or after a disaster, the absence of health workforce training in protocols for GBV prevention and management and the lack of safe places leave women exposed to physical and mental harassment and sexual abuse. For example, during the COVID-19 pandemic, women and girls were increasingly vulnerable to domestic and sexual violence as a result of the combination of lockdown measures, economic and social stress, and reduced public services for GBV survivors. The need for more trained health workers knowledgeable in GBV response during emergencies exacerbates the absence of such protocols, leaving health workers unprepared to handle the increased risks women face during public health crises.

5. **While Türkiye's location at the crossroads of continents traversed by humans, animals, and potentially hazardous cargo – with Istanbul a global air, sea, and land transport hub – makes it particularly vulnerable to disease outbreaks and pandemics, its location also make it a potential champion for global health security.** Türkiye has the potential to support multi-country coordination and capacity strengthening agendas, including through mechanisms of knowledge exchange and cross-border action that can improve health security capacities across multiple regions. The country also sits near some active global geopolitical conflicts. This provides a unique opportunity for Türkiye to use its health emergency prevention, preparedness, and response (HEPPR) strengthening agenda to support and advance regional progress on health development goals, mitigate the impact of ongoing widespread emergencies, and strengthen the resiliency of neighbouring health systems, even in the face of external crises.

B. Sectoral and Institutional Context

6. **Türkiye's health sector reforms have increased access to affordable health care and improved health outcomes.** In 2003, Türkiye launched a major national healthcare reform program, the Health Transformation Program (HTP),[11] to address key system inadequacies in financial efficiency of health services. The results show that it has been effective in improving health outcomes and increasing both the utilization of health services and health coverage. Türkiye's progress in several areas has outpaced that of other comparable upper middle-income countries. The newly established primary health care network of family medicine centers has demonstrated positive impacts on access to and quality of services, with annual per capita visits increasing from 1.1 in 2002 to 3.9 in 2022. Reforms in the Social Security and Universal Health Insurance Law[12] also resulted in significant improvements in the range of health services provided and overall health coverage of the population. By 2023, 89 percent of the population was covered by the Universal Health Program.[13]

7. **To sustain progress, support to respond to health emergencies is critical.** International assessments of global health security capacity indicate that Türkiye's absolute and relative capacity to prevent, detect, and respond to PHEs needs to be strengthened to fully address all potential health hazards. In 2021, the Global Health Security Index[14] indicated

[7] Erman, Alvina, Sophie Anne De Vries Robbe, Stephan Fabian Thies, Kayenat Kabir, and Mirai Maruo. 2021. Gender Dimensions of Disaster Risk and Resilience: Existing Evidence. Washington, DC: World Bank. https://hdl.handle.net/10986/35202.
[8] Gennari, F., Diana Arango, and Nidia Hidalgo. 2015. "Violence Against Women and Girls." Finance and Enterprise Development Brief. Washington, DC: World Bank. https://hdl.handle.net/10986/21087.
[9] https://eca.unwomen.org/sites/default/files/2023-03/UN%20Women%20Brief%20on%20Earthquake%20in%20Turkiye%20Gendered%20impacts%20and%20response_0.pdf
[10] https://eca.unwomen.org/en/where-we-are/turkey/ending-violence-against-women
[11] "Sağlıkta Dönüşüm Programı" (Health Transformation Program). https://www.saglik.gov.tr/TR,11415/saglikta-donusum-programi.html.
[12] Sosyal Sigortalar ve Genel Sağlik Sigortasi Kanunu (Social Security and General Insurance Law). https://www.mevzuat.gov.tr/mevzuatmetin/1.5.5510.pdf.
[13] Sosyal Güvenlik Kurumu (Social Security Institution). https://www.sgk.gov.tr/Istatistik/Index/6863b1e8-c384-4f46-90c6-511dac2376d2/
[14] https://ghsindex.org/.

that Türkiye falls below the regional average score for detecting and responding to potential outbreaks and for providing an enabling environment to manage risks and vulnerability (Table 1). Türkiye's lower than average detection score indicates gaps in lab capacities to detect and prioritize diseases, capacity to transport specimens to testing facilities, real time surveillance and reporting, case-based investigation, epidemiology workforce, and access to surveillance data. Similarly, the lower- than- average response score reflects shortages in emergency preparation and operation, response planning, risk communication, and access to communication infrastructure. Other global assessment frameworks have identified specific gaps in core capacities. The 2022 scores from the State Parties Self-Assessment Annual Reporting, which measures progress towards, and capacity for, implementation of the International Health Regulations, demonstrate that Türkiye scored lower than other European countries in several areas, including: zoonotic disease threats, risk communication and community engagement, health security policy and legal instruments, health emergency management and planning, and laboratory biosecurity and biosafety. These assessments also note challenges in cross-cutting areas including One Health (OH) coordination, particularly for information sharing across human, animal, and environmental health sectors; linking public health agents with security authorities; and cross border collaboration with neighbouring countries on emerging public health and animal health issues.

Table 1: Global Health Security Index scores by capacity, [15] Türkiye and Europe (average), 2021

	Overall	Prevent	Detect	Respond	Health	Norms	Risk
Türkiye	50	51.1	41.4	36.6	53.9	59.7	57.2
Europe	n. a	49.7	58.3	47.3	42.8	55.4	71.7

Source: Global Health Security Index.

8. **Climate change and weather hazards have implications on human health in Türkiye**. The risk is not hypothetical; climate change and weather hazards have been observed with greater frequency and intensity over the last two decades, resulting in increased acute and protracted PHEs caused by natural hazards and an associated rise in vulnerability to outbreaks of climate-sensitive diseases, including water- and vector-borne diseases. Extreme temperatures leading to heat waves increases morbidity and mortality in the country.[16,17,18,19] Climate change would result in food insecurity and water scarcity in the country, further increasing individuals' comorbidities.[20] Further, changes in climatic conditions increase the risk of introduction and spread of communicable diseases. This is likely to be exacerbated by limited health system capacity to address such surges in acute need.[21]

9. **Coordinated, systems-based strategies using learning from recent emergencies are needed to further build an**

[15] The Global Health Security Index is an internationally recognized assessment to evaluate country capabilities to deliver on the International Health Regulations mandate on managing global infectious disease threats. The framework consists of 37 indicators in six categories that represent critical core capacities for outbreak management: (i) prevention of the emergence or release of pathogens; (ii) detection and reporting for epidemics of potential international concern; (iii) rapid response to and mitigation of epidemic spread; (iv) sufficient and robust health system; (v) compliance with international norms; and (vi) risk environment.

[16] Can, G., Ümit Şahin, Uğurcan Sayılı, Marjolaine Dubé Beril Kara, Hazal Cansu Acar, Barış İnan, Özden Aksu Sayman, Germain Lebel, Ray Bustinza, Hüseyin Küçükali, Umur Güven, and Pierre Gosselin. 2019. "Excess Mortality in Istanbul during Extreme Heat Waves between 2013 and 2017." *International Journal of Environmental Research and Public Health* 16 (22): 4348. https://doi.org/10.3390/ijerph16224348.

[17] Ozturk, Y., Hakki Baltaci, and Bülent Oktay Akkoyunlu. 2023. "The Impacts of Heat Waves on Hospital Admissions and Mortality in the Fethiye Province of Turkey." *Portuguese Journal of Public Health* 41 (2): 94–101. https://doi.org/10.1159/000530747.

[18] Oray, N. C., Deniz Oray, Ersin Aksay, Ridvan Atilla, and Basak Bayram. 2018. "The impact of a heat wave on mortality in the emergency department." *Medicine (Baltimore)* 97 (52): e13815. doi: 10.1097/MD.0000000000013815.

[19] Şeker, M., İsmail Koyuncu, and İzzet Öztürk (eds). 2020. *The Report on Climate Change and Public Health in Turkey*. TÜBA Report No: 38. Ankara: Turkish Academy of Sciences Publications.
https://www.tuba.gov.tr/files/yayinlar/raporlar/Climate%20Change%20%20and%20%20Public%20Health%20in%20Türkiye.pdf.

[20] World Bank Group. 2022. *Turkey Country Climate and Development Report*. Washington, DC: World Bank Group.
https://openknowledge.worldbank.org/server/api/core/bitstreams/80bdfcf8-73b1-42b3-b107-1629f64a1f0c/content

[21] G20 CLIMATE RISK ATLAS: Impacts, policy, economics: Türkiye.

emergency-ready and resilient health system, ensure delivery of public health functions, and mobilize additional resources for pandemic preparedness and response (PPR). Much of Türkiye's preparedness capacities are delivered through a centralized approach but are often not well integrated across the healthcare and public health systems. While some planning for specific hazards and PHEs exists, many strategies are substantially outdated, do not incorporate best practices and experiences, and are insufficiently multisectoral to cover the wide range of essential functions beyond the health sector needed to address PHEs. For instance, the most recent pandemic preparedness plan was created in 2019 to address influenza and needs to be updated based on new data and evidence from COVID-19 and expanded to all priority pathogens and nonbiological hazards. It also needs to incorporate considerations for the private sector and to factor in all levels of the health system, including the health facility and community levels. Such planning is also necessary in relevant non-health sectors – for example, agriculture and environment sectors – to ensure aligned and effective coordination mechanisms. Testing these plans, through a systematic, institutionalized performance improvement approach that regularly assesses performance against simulated and actual detected events, is critical to ensuring national readiness for and resiliency against PHEs.

10. **Substantial advances in national adoption of digital health systems by the healthcare and public health workforce and related institutions can facilitate further improvements in enabling delivery of PPR capacities**. Under the HTP, exclusive importance was given to the development and use of health information systems that would facilitate operations, decisions, and policy making. Further strengthening of these capacities was prioritized during COVID-19. Consequently, as of July 2023, all public health providers – primary, secondary, and tertiary care institutions – and 98 percent of private hospitals share individual-level clinical data with the e-Nabiz (e-pulse) platform of the Ministry of Health (MoH).[22] Other functions have been incorporated to facilitate service delivery during emergencies. The platform can also be adapted for further expansion of health services, including hospital information management, immunization tracking, supply chain and logistics management, and key public health functions, such as digital surveillance reporting and laboratory informational management, remote care arrangements, and online disease management to facilitate early diagnosis of chronic diseases. The current public health surveillance and notification portal – the Infectious Disease Surveillance and Early Warning System (EWS) – is integrated with most of the other information platforms, including e-Nabiz, via electronic case reporting. While the country's mature health information systems provide a strong foundation for digitally integrated public health data, Türkiye continues to upgrade, improve, and integrate the surveillance and notification systems based on lessons learned and expanded public health needs.

11. **Existing national capacity for vaccine production and research needs further expansion to prevent emergence and spread of infectious diseases.** Local and regional manufacturing capacity for vaccines and medical countermeasures[23] is a critical need for countries that may have limited access to global supplies of novel or emerging technologies during an international health emergency. Türkiye has a long history of vaccine development and production for domestic and international usage. The national medical regulatory authority recently achieved maturity level 3, which validates the strong stability and functioning of the regulatory system for medical products as assessed by the World Health Organization (WHO).[24] This existing manufacturing infrastructure facilitated rapid, coordinated research and development efforts for COVID-19 medical countermeasures and led to the development of Türkiye's own domestic inactivated vaccine candidate. But these achievements were still constrained by gaps, including limited capacity for newer vaccine technologies and slow scaling up of production that forced reliance on international purchasing to initiate an early and aggressive national vaccination program. Maintaining and expanding the capacity built during the COVID-19 pandemic will facilitate rapid access to supply before, during, and after PHEs.

[22] "e-Nabiz (Türkiye's personal health record system). https://enabiz.gov.tr/.
[23] Medical countermeasures include biologic products, medicines, devices, and medical supplies used to prevent, prepare for, respond to, and mitigate health threats. These may include drugs and therapeutics, diagnostics and tests, ventilators, and personal protective equipment.
[24] "WHO Global Benchmarking Tools for evaluation of national regulatory systems." https://www.who.int/tools/global-benchmarking-tools.

12. **Expanding vaccine production is one of the cornerstones of the national strategy for pandemic preparedness.** In 2020, with support from the Health Systems Strengthening and Support Project (HSSSP, P152799), the Government initiated the development of the new Vaccine Production Center (VPC) in Ankara to strengthen the country capacity to respond to surge demand for vaccines in case of outbreaks. However, as part of the May 2023 restructuring, funding for equipping the Ankara VPC was reallocated to support earthquake-related activities. As such, no VPC equipment or goods were procured under the HSSSP; instead, these will be financed by this project. Completing the establishment of the VPC will allow Türkiye to play an important role in vaccine production to meet the needs of countries in the region.

13. **Türkiye has made significant progress in strengthening its early warning and surveillance systems, and consistently scores high in global assessments for surveillance capacities.** Currently, several surveillance modalities are incorporated in the system, including indicator-based and event-based systems, though the population and geographical coverage of each of these differs. The country has extensive laboratory networks, with reference laboratories at the national level that are capacitated to detect several emerging or high-impact pathogens, including those which cause Crimean-Congo Haemorrhagic Fever, Tularaemia, and polio. As of 2021, there were 84 public health laboratories in Türkiye, 19 of them reference laboratories.[25] The Turkish laboratory network for polio also serves the needs of other countries in the region. Türkiye is also an active member of WHO's Global Antimicrobial Resistance (and Use Surveillance System, the first global collaborative effort to standardize Antimicrobial Resistance (AMR) information gathering and sharing, and to strengthen knowledge through surveillance and research.

14. **Despite the broad range of existing surveillance system components, actual performance against COVID-19 and other PHEs indicates that these systems still require targeted strengthening.** The overall performance of the surveillance system can be further improved through the introduction of new technologies and components, as well as the comprehensive adoption of a OH approach and prioritization based on the pathogen risk. Different modalities and components of the surveillance system – for example, events-based surveillance, especially in communities and other non-traditional health sector sources – and laboratory network are not equally well developed at the national and subnational levels and are not fully integrated to effectively respond to surge demands. More granular identification of surveillance system performance gaps will require assessments to define the approach for targeted expansion and operationalization. Additionally, the current system does not sufficiently leverage public-private partnerships and lacks sufficient interoperability and integration of information systems both between sectors and within the health system. A next-generation Infectious Disease Surveillance and EWS platform is needed to improve notification and response functions, incorporate new data integration needs such as information from other ministries, and adopt new standards and data integration models to support the expanding role of digital surveillance tools in public health.

15. **OH needs to be integrated across HEPPR capacities, including effective coordination and communication mechanisms between human, animal, and environmental health sectors, to enhance the effectiveness of early warning capabilities.** Adoption of the OH approach is at a nascent stage in Türkiye. The country has developed the Zoonotic Diseases Action Plan and surveillance programs for priority zoonotic diseases. The National Action Plan on AMR has also been drafted and costed, and several campaigns have been launched, which have contributed to the gradual reduction in national antibiotic consumption. However, integrating this approach for strengthening HEPPR can be further advanced and systemized by improving coordination, information sharing, and joint capacity building, and by learning from good practices relating to the multisectoral responses and strategies dealing with other high-risk hazards including earthquakes and air pollution.

16. **Türkiye's laboratory system and diagnostic capacity needs further improvement by integrating laboratory infrastructure, strengthening limited workforce capacity, and enhancing capacities that limit early and accurate**

[25] Public Health Laboratories (MoH, GD of Public Health). https://hsgm.saglik.gov.tr/tr/halk-sagligi-laboratuvarlari.html.

identification of infectious diseases. Rapid scale-up of laboratory system capacity for COVID-19 insufficiently addressed existing inefficiencies, and prioritized planning for the development of a comprehensive and integrated national laboratory network system has not yet been defined. Meanwhile, most peripheral laboratories will benefit from increased capacity for molecular diagnostics of food- and waterborne diseases, bioinformatic analysis of bacteria and fungi, and other advanced diagnostic techniques for improved pathogen detection. Laboratory staff capacity in biocontainment and biohazards management is weak, risking the spread of infectious pathogens and endangering the health workforce. Weaknesses in specimen transport, especially at periphery continue to challenge timely and accurate pathogen detection. Laboratory information is not well integrated with other key health information platforms to allow for comprehensive access to critical public health data. The resulting gap for diagnostic validation or case confirmation for events-of-concern limits surveillance capacity and demands linkages and standardized interoperability for improving routine information management for laboratories. Additionally, the laboratory stock management and inventory system can be further strengthened to facilitate access to, and efficient utilization of reagents, tests, and other consumables in routine and emergency contexts.

17. **Recent prioritized investments in advances to expand the scope and coverage of the surveillance system provide a strong foundation for scaling up implementation to complement and boost existing capacities.** Since 2020, efforts have been made to build genomic surveillance capacity and invest in sequencing equipment, computing infrastructure, personnel training, data management, and data sharing for SARS-CoV-2, the coronavirus strain. To consolidate and expand the progress made thus far, in 2023, Türkiye developed a five-year national genomic surveillance strategy that outlines the aim to establish an integrated and sustainable genomic surveillance network to address all areas of infectious disease and wider public health needs. The strategy aims to build upon existing capacities, address weaknesses, and capitalize on opportunities to utilize genomic approaches for preparedness across a range of pathogens.[26] Progress in other innovations, such as wastewater surveillance, have also been explored to add further coverage and capacity for early warning in detecting potential trends and presence of pathogens in human and animal populations.

C. Relevance to Higher Level Objectives

18. **The proposed Project is aligned with World Bank's higher-level objectives, global and regional strategies, the relevant Country Partnership Framework (CPF), and the wider health sector development agenda.** In the wake of COVID-19, strengthening PPR for pandemics and health emergencies has emerged not only as a clear global need, but also as an institutional and corporate priority for the World Bank. Advancing PPR capacities is a global public good. The Project is in line with the World Bank's livable planet actions, in particular with the vision of resilience and inclusion, as well as with one of the priority global challenges identified under the Evolution Roadmap, namely Pandemic Prevention and Preparedness and Response.[27] The latter has been further developed into the Emergencies Prevention, Preparedness, and Response Global Challenge Program, one of six World Bank Group-wide programs which aims to demonstrate impact at scale to respond to key institutional and global priorities. The Project is also consistent with the new Türkiye CPF FY24-FY28,[28] specifically with the Objective 5 "Reduce disparities in health and education access and quality" under High-Level Outcome 2 "Inclusive services and jobs", and with the Objective 7 "Enhanced disaster resilience and preparedness" under High-Level Outcome 3 "Strengthened resilience".

19. **The Project is also aligned with key priorities of the Turkish Government, including the most recent Türkiye's 12th National Development Plan for 2024-2028.**[29] The Government of Türkiye considers PPR for PHEs a key priority in its

[26] https://www.who.int/europe/news/item/03-10-2022-developing-and-implementing-a-national-genomic-surveillance-strategy---t-rkiye-s-experience
[27] Ending Poverty on a Liveable Planet: Report to Governors on World Bank Evolution," September 2023.
[28] Report No. CPF0000004, discussed by the Board of Executive Directors on April 9, 2024.
[29] "The 12th Development Plan." https://onikinciplan.sbb.gov.tr/.

health sector strategy against potential future outbreaks. Specifically, the 12th National Development Plan emphasizes capacities for strengthening preparedness and response capacity for infectious disease outbreaks and health emergencies, including improving existing diagnosis, monitoring and EWSs; strengthening vaccine production; strengthening supply chains for surge capacity; and updating preparedness plans for emergencies. The 12th National Development Plan also highlights the need to expand and strengthen preventive and curative services for PHEs supported by digital technology.

20. **Public sector investment in pandemic preparedness contributes to a critical global public good**. Investing in pandemic preparedness is a public good for the provision and production of critical health information and community outreach. Public sector involvement can better respond to market failure in the case of health shocks with the aim of improving social welfare. In addition, the public sector intervention in pandemic preparedness is needed to fill the gaps in areas that are less likely for the private sector and/or individuals to invest.

21. **The Project will address some of Türkiye's public health climate change adaptation needs, as stated in the updated First Nationally Determined Contribution of 2023**,[30] which prioritizes adaptation and making health systems resilient to climate change. The Project will contribute to achieving Türkiye's national climate change adaptation strategy and action plan,[31] including measures regarding vaccination programs and vector control, tropical diseases diagnosis laboratories, and developing emergency response action plans—including EWSs. As a country that faces significant vulnerability to the impacts of climate change, Türkiye has made ambitious commitments to net zero emissions by 2053. The Project has a low risk of having negative impact on Türkiye's low-greenhouse gas (GHG) emission development pathways.

II. PROJECT DESCRIPTION

A. Project Development Objective

22. **The Project Development Objective is to strengthen Türkiye's capacity to (i) produce vaccines, and (ii) detect and initiate a rapid response to public health emergencies.** To track the achievement of the PDO, two key indicators will be utilized:

- PDO 1: VPC produces at least one vaccine which (i) receives authorization from Türkiye's National Regulatory Authority, the Turkish Medicines and Medical Devices Agency, and (ii) is subsequently submitted to WHO for Pre-Qualification.
- PDO 2: Percent of events of public health concern[32] with all rapid response actions completed within seven days.

B. Project Components

[30] *Republic of Türkiye Updated First Nationally Determined Contribution*.

[31] Turkish Republic Ministry of Environment and Urbanization, *Türkiye's National Climate Change Adaptation Strategy and Action Plan 2011–2023*, Ankara, 2012.

[32] Event of public health concern is defined as an event that poses immediate threat to human health and requires public health action such as disease control measures.
Early response action completion is the latest date on which any of these seven 7-1-7 early response actions are completed (i.e. all actions must be completed): (1) initiate investigation or deploy investigation/response team; (2) conduct epidemiologic analysis of burden, severity and risk factors, and perform initial risk assessment; (3) obtain laboratory confirmation of the outbreak etiology; (4) initiate appropriate case management and infection prevention and control measures in health facilities; (5) initiate appropriate public health countermeasures in affected communities; (6) initiate appropriate risk communication or community engagement activities; and (7) establish a coordination mechanism.

https://717alliance.org/digital-toolkit/#step-1-collect-timeliness-data-and-calculate-7-1-7-performance

23. **Component 1: Strengthen vaccine production capacity (USD 150 million).** This component will focus on preventing infectious diseases by enabling vaccine production to improve access to vaccines, which proved critical during COVID-19. It will continue efforts initiated in 2020 for the purchasing of equipment of the Ankara VPC. Specifically, it will finance procurement of medical and technical equipment required for the operation of the VPC. All new medical and technical equipment will comply with energy-efficiency standards that go beyond standard practice and result in a substantial reduction in GHG emissions. This component will also support technical assistance (TA) to define and prioritize the research agenda for vaccine manufacturing technologies – with particular consideration of climate-sensitive diseases and the impact of climate on changing infectious disease risks – to align manufacturing regulations to international standards, and to support the completion of the WHO Pre-Qualification (PQ) certification process, as well as to procure and establish physical components required for design, supply, and installation needs to meet WHO PQ requirements and to train and support capacity building of VPC staff.

24. **Component 2: Strengthen national and subnational capacities for detection of and response to health emergencies (USD 92 million).** This component will finance the development and expansion of critical core capacities across health and public health systems at all levels to strengthen emergency readiness for a wide range of potential threats such as disease outbreaks, climate shocks, and humanitarian emergencies, including earthquakes. Activities will target systems, workforce training, and institutional capacities, and will incorporate enabling and cross-cutting capabilities and approaches including integrated and digital solutions to facilitate improvements of core PPR capacities. A OH approach across animal, human, climate change, and environmental sectors is also critical to addressing the broad range of potential threats. To the extent possible, OH principles will be adopted throughout Project subcomponents and selected activities. The OH approach will focus on strengthening enabling activities such as: (i) OH governance and coordination; (ii) OH related capacity building; and (iii) infectious disease related info-sharing and system interoperability. This entails: (i) establishing a functioning OH coordination mechanisms at national and selected provinces; (ii) developing and implementation of OH annual work plans; (iii) developing and disseminating of annual OH reports; (iv) exploring Info-sharing mechanisms; and (v) conducting dissemination activities such as national OH conference. This component will be delivered through a combination of TA, capacity building, and provision of critical goods and equipment.

25. ***Subcomponent 2.1: Early warning and surveillance*** (**USD 24 million**). This subcomponent will support strengthening the surveillance system and public health intelligence at all levels to improve early and accurate detection of potential hazards. Multisectoral coordination for OH will be incorporated, where possible and appropriate, including activities in EWS, data sharing and information exchange, and joint workforce capacity building. Climate change is a primary impetus and focus of this activity. The subcomponent will therefore incorporate climate and meteorological indicators in EWS and surveillance systems, and prioritize relevant interventions for climate-sensitive diseases, including vector-borne and waterborne diseases. This subcomponent will also apply a strategy of active systems-based performance assessment and improvement that optimizes timeliness, sensitivity, and cost efficiency to counter realized threats. Activities will reinforce bidirectional information flow and a feedback loop by supporting reporting, analysis, and communication of surveillance data to inform public health action. Specifically, this subcomponent will support the following activities.

a. **Prioritization and planning for greater impact.** Two hazard/risk assessments at national and local levels will be conducted at the commencement and mid-project to identify and prioritize biological hazards (particularly climate-sensitive pathogens) and to keep the lists updated to incorporate risk assessments of non-biological hazards done by other government departments and to reflect the evolving health and environmental conditions. Additionally, a mapping and gaps assessment of national and subnational surveillance systems across public and private sectors will be conducted to inform preparedness and response planning.
b. **System performance, expansion, and improvement to increase surveillance and EWS performance in detecting potential threats**. This includes: (i) improving routine events-based surveillance and introducing new forms of community-based surveillance; (ii) enhancing vector surveillance; (iii) supporting adoption of advanced data

science and analytics techniques such as risk mapping and modelling environmental sampling, statistical anomaly detection; (iv) implementing national genomic surveillance strategy; (v) developing prioritized strategies for other disease surveillance expansions, such as wastewater surveillance; and (vi) implementing and expanding systematic multisectoral performance improvement program through regular supervision and assessments against benchmarks, such as the 7-1-7 timeliness framework.[33] Climate change is a primary impetus and focus of the first three activities, which will use meteorologic data to better understand the impacts of climate change on infectious diseases and to address the additional burden of disease as well as the changing transmission dynamics due to climate change.

c. **Workforce skills.** Support will be provided for training of trainers and cascaded training of frontline provincial health workforce in core capacities, including applied field epidemiology, OH, climate emergencies, and disease surveillance.
d. **Critical hardware.** Peripheral health facilities and workforce will be equipped with communications tools – for example, mobile and network connectivity – to facilitate real-time reporting of potential public health threats.
e. **Information systems and data.** A new integrated health information system framework with upgraded capacities including mobile, and web-based functions will be developed, and surveillance system workflows will be updated to capture data from unsystematized non-health sources, such as school screening programs, and integration of meteorological data into the EWS and surveillance systems.

26. ***Subcomponent 2.2: Laboratory and diagnostics systems*** **(USD 13 million).** This subcomponent will support strengthening of laboratory systems and diagnostics capacities to detect and monitor infectious and environmental hazards, especially at periphery. The laboratory system will similarly be assessed through active performance improvement, with a specific focus on facilitating timely, accurate diagnostic validation, including:

a. **Improved planning.** Specifically, the following will be developed: (i) mapping and gaps assessment of national and subnational laboratory systems and diagnostics capacities including staffing across public and private sectors; and (ii) updated laboratory and diagnostics emergency preparedness and response plans at all levels for priority pathogens, including those affected by climate change, and national bio-risk management protocols, in alignment with international biosecurity guidance.
b. **System performance and improvement.** This includes alignment of specimen referral and transport system workflows at peripheral level to improve availability and timeliness of diagnostic confirmation across the tiered laboratory system, including support to referral network structure – for example, route optimisation, coverage, sample delivery protocols – and specimen packaging.
c. **Workforce skills.** This includes capacity building and training of regional and peripheral laboratory staff for biocontainment and bio-risk management to mitigate potential spread of pathogens, advanced microbiology and molecular diagnostic strategies such as syndromic panels, modular testing, climate emergencies, and TA and knowledge transfer in vector surveillance.
d. **Critical hardware.** This includes equipping laboratory facilities with necessary personal protective equipment, reagents, equipment, network connectivity, and other items needed to enable adoption of new diagnostics capabilities.

27. ***Subcomponent 2.3 National planning and emergency response coordination for emergency-ready health systems*** **(USD 55 million).** This subcomponent will strengthen national preparedness planning for health emergencies and enhance the resilience and response capacity of the health system against health emergencies. It will facilitate delivery of critical public health functions across the workforce of all allied health professions, reinforce governance of key capacities for emergency coordination, and test these capacities through a learning curriculum of simulated and practical exercises.

[33] 7-1-7 is a framework that promotes early and effective action against public health threats. It uses clear performance standards and timeliness metrics for detection, notification, and response to realised events that can be used to actively inform decision-making in real time and longer-term performance enhancement strategies. https://717alliance.org/

The primary anticipated threats are outbreaks, climate shocks, and humanitarian emergencies, including earthquakes. Climate change, which is fueling emergence and spread of infectious diseases in the country, including zoonotic diseases, waterborne diseases, and vector borne diseases, is one of the primary impetuses and focal areas of the component. Specifically, this subcomponent will support the following activities.

a. **National preparedness and response planning.** This activity will focus on: (i) reviewing and updating the 2019 MoH National Influenza Preparedness Plan to a national all-hazards health emergency preparedness plan that covers all levels of the health system and the community level. It will build on lessons learned from COVID-19 and other recent health emergencies, particularly the importance of developing surge workforce strategies for all allied health professions and collaborating with the private sector to provide surge capacity, including the Health Institutes of Türkiye[34] to strengthen its support to the private sector in the production of medical products and technologies in support of health emergencies; and (ii) updating and developing national and subnational (facility) plans to strengthen operational readiness. This includes protocols for all-hazards emergency response operations, decision trees and workflows, roles and responsibilities, and hazard-specific planning, ensuring that these plans include explicit protocols to respond to GBV during emergencies and address immediate physical and safety needs of women, such as separate toilets, and sanitation activities. Climate change will be incorporated as a critical driver of the primary hazard focal areas for these preparedness and response plans, which will cover infectious disease outbreaks such as climate sensitive diseases, natural hazards like earthquakes, and humanitarian emergencies.
b. **Workforce skills and system performance improvement.** This activity will support: (i) strengthening surge capacity of the allied health professions and health research workforce, including training and equipping of multidisciplinary response teams and front-line health care workers to respond to and mitigate the impact from priority threats; and (ii) implementing regular, systematic delivery of multisectoral, multi-ministerial simulation exercises, tabletop exercises, and drills involving all levels of the health system to address a variety of biological and nonbiological health emergency threats, with at least one exercise per quarter at the national and subnational levels. To address the critical shortage of health workers trained and certified in new GBV protocols, the Project will develop and implement training programs for men and women. These programs will focus on identifying and referring GBV survivors to health, justice, and protection services during emergencies. Additionally, the training will emphasize sensitivity to survivors' specific circumstances and gender roles, reducing the risk of further exclusion and increased vulnerability.[35]
c. **Critical hardware support.** This subcomponent will also equip and establish the Ankara Simulation-Based Training Center (Ankara SEUM) to conduct practical exercises at scale for health emergencies and act as a regional leader for strengthening operational HEPPR capacities.
d. **Coordination and governance.** This activity will support coordination and governance to establish a multisectoral coordination and collaboration platform or body for: (i) addressing data and information needs relevant to health emergencies, including necessary development of enabling public health legislation or regulations, and upgrading the national health statistics system to act as an information sharing platform across ministries; and (ii) dealing with OH and zoonotic threats by promoting information sharing, strategic alignment, and mutual coordinated action across animal, human, and environmental health and other relevant sectors.

28. **Component 3: Project Management and Monitoring, and Institutional Capacity (USD 8 million).** This component will support routine project management, including coordination of technical activities in all components, fiduciary functions, audits of project financial statements, environmental and social (E&S) compliance, and regular monitoring of and reporting on implementation. This component will also support MoH's institutional capacity during a period of one (1) year starting at the Project Effective Date. It will finance project operating costs, including translation, interpretation, equipment supporting costs, and staffing costs of the Project Management Support Unit (PMSU).

[34] Türkiye Sağlık Enstitüleri Başkanlığı: TÜSEB
[35] https://eca.unwomen.org/sites/default/files/2023-03/UN%20Women%20Brief%20on%20Earthquake%20in%20Turkiye%20Gendered%20impacts%20and%20response_0.pdf

29. **Component 4: Contingent Emergency Response (no funds allocated).** The objective of this Contingency Emergency Response Component (CERC) is to improve the Government's response capacity in the event of an emergency. An eligible emergency is an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or manmade crises or disasters. At the request of the Government, the World Bank will reallocate uncommitted funds from other components into this component. The mechanism for declaration of emergency would be in accordance with the current legislation in the Republic of Türkiye. This component would support rapid response to a request for urgent assistance in respect of an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or manmade crises or disasters. In such a case, funds would be reallocated from other components to finance goods and consulting services. The specific activities to be financed by the funds reallocated to CERC are event and demand driven. However, this component cannot be used to finance salaries or any expenditures that could trigger any of the World Bank's safeguard policies. To facilitate activation of the CERC in the event of an eligible crisis or emergency, a CERC Manual and draft Emergency Action Plan will be prepared and will be adopted prior to disbursement. The contents of this CERC Manual represent the framework by which the CERC will be activated and by which the approved activities will be coordinated and implemented in accordance with World Bank's and national policies and procedures as agreed with the World Bank. The Project Operations Manual (POM) will include considerations for climate risks on both mitigation and adaptation to ensure the Project is aligned with the goals of the Paris Agreement.

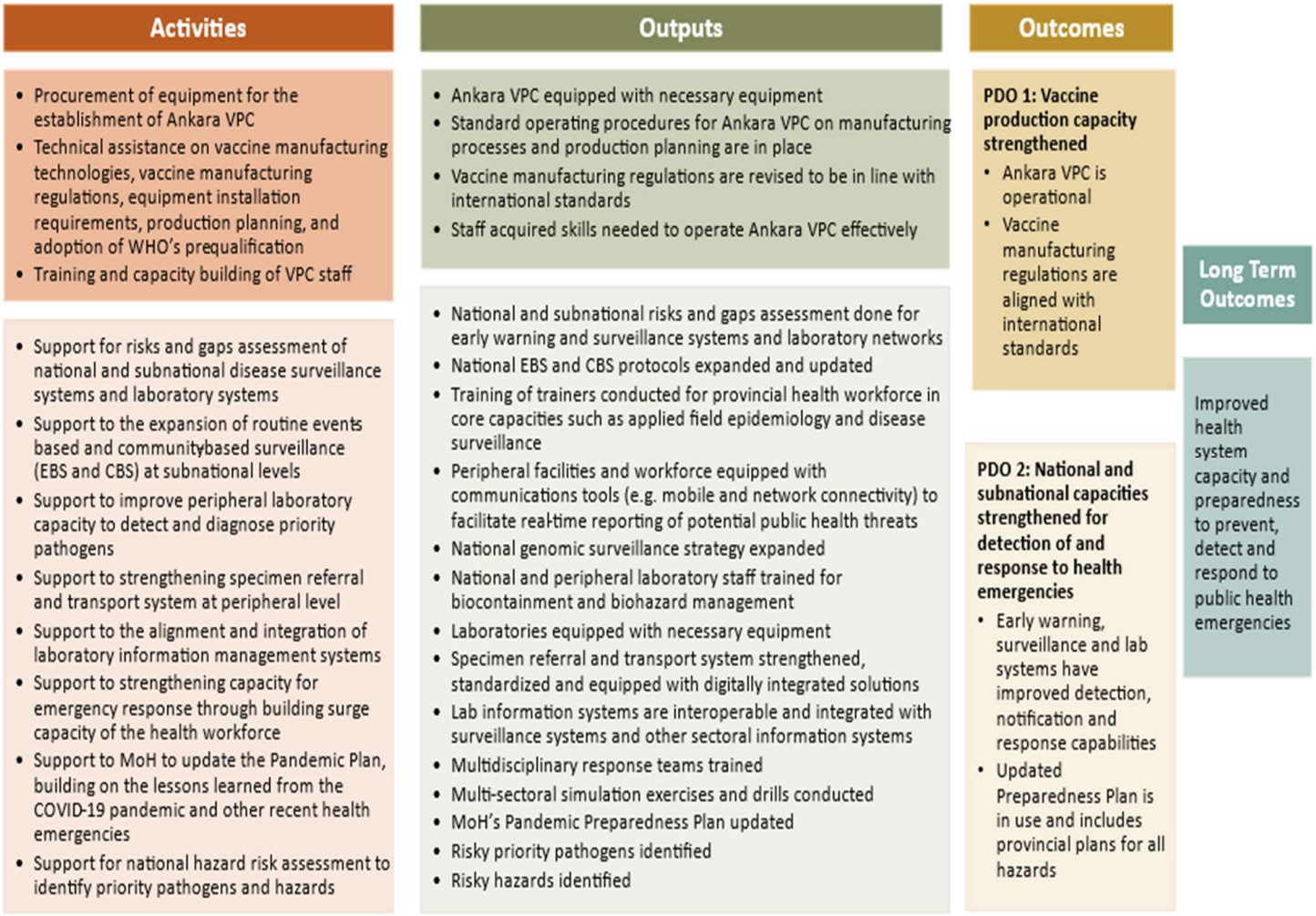
C. Project Beneficiaries

30. **The Project directly benefits the health workforce and health sector administrators and decision-makers**. First, health professionals will benefit from activities to improve their knowledge and diversify their tools to better respond to PHEs. Similarly, central and district health authorities, local communities, and health institutions will be enabled with faster, better, and more coordinated response to the next health crisis by having in place more timely and robust mechanisms for detecting, reporting, and responding to potential health events. Additionally, the health sector in general, including providers, facilities, laboratories, and scientific and research institutions will benefit from improved transparency and early warning about potentially dangerous outbreaks, and faster development and deployment of new vaccines. Furthermore, Government entities and decision-makers will benefit from the expanded digitalization of the health sector. Project support to implement the health management information systems improve data analytics capabilities and modernize digital infrastructure will enhance decision-making and improve governance. The ability to share data through the implementation of interoperability standards and protocols and the use of cloud solutions will improve opportunities for collaboration and analysis of health information to improve timeliness and effectiveness of decision-making.

31. **More importantly, the Project will benefit the entire population of Türkiye.** Increased access to domestically produced vaccines over the long term, improved disease surveillance, and strengthened capacity for emergency response will improve the ability of the overall health system to protect the population and quickly respond to emerging health needs, prolong life, and improve quality of life. The Project will contribute to Government efforts to improve access to vaccines across different regions and populations within the country. Additionally, by investing in pandemic preparedness and vaccine production, the Project will contribute to Türkiye's health security, helping prevent the spread of infectious diseases that can have significant health, economic, and social impacts.

D. Results Chain

Figure 1: Theory of Change for the Project



32. **Taken together, activities financed by the Project will support vaccine production and early warning, surveillance, and laboratory network systems.** Activities will include the procurement of equipment for Ankara VPC, TA for vaccine manufacturing technologies, regulations and WHO PQ, and pandemic preparedness planning, training, and capacity building in several areas including surveillance, risk assessment and laboratory network strengthening. These activities will contribute to producing outputs, such as refurbished Ankara VPC, developed standard operating procedures and regulations for vaccine manufacturing, updated pandemic preparedness plans, strengthened surveillance and laboratory network systems and skilled health workforce for pandemic preparedness and response. These are expected to lead to a fully operational vaccine manufacturing facility in line with international standards, an up-to-date and effective pandemic preparedness plan, and enhanced and strengthened surveillance and laboratory networks systems. Over the long-term, the Project will contribute to a stronger health system with enhanced capacity and preparedness to prevent, detect and respond to public health emergencies, which will bring about better population health status, improved human capital, and a more livable planet.

E. Rationale for Bank Involvement and Role of Partners

33. **The World Bank has been a key development partner of the Government of Türkiye in the health sector over the last 35 years.** Through lending operations and TA, the Bank is recognized as an important partner for its rich knowledge in the planning and management of complex health care reforms and transferring new technologies and innovations. Through these projects, the World Bank brings relevant experience from extensive regional and global knowledge. The World Bank is uniquely positioned to support Government efforts to strengthen their health systems resilience and preparedness to respond to public health emergencies and threats. For instance, the World Bank was a leader in response to the health and economic impact of the COVID-19 and incorporated the necessary experience and high standards to enable further investment in health systems preparedness.

34. **The Project complements the efforts of other development partners, mainly the WHO and the European Union.** Türkiye has an existing ecosystem of important relationships and engagements with other development partners on PPR, allowing it access to predictable, long-term, systems level, sector-wide financing and TA, which enables delivery of a coherent agenda and holistic approach to strengthening PPR. The European Union-funded Health Safety in Türkiye Project, conducted in collaboration with the WHO, aims to strengthen the early warning and response system at local and central levels to enhance functional epidemiological capacity at local level through the Turkish field epidemiology-certified training program, bio-risk management training, laboratory quality management system training, and to improve the capacity of local microbiology laboratories. Concerning the identification and control of vector-borne diseases, the European Health and Digital Management Agency-funded CLIMOS project[36] aims to detect the spread of endemic sand flies in Türkiye to make predictions and take preventive measures by mapping Türkiye's Leishmaniasis risk through identification of the pathogens carried by these species. World Bank investments complement these important partnerships by contributing to the strengthening of the national laboratory network and early warning and surveillance systems.

F. Lessons Learned and Reflected in the Project Design

35. **The Project incorporates lessons learned from the World Bank's health sector operational program in Türkiye**[37] **and draws on World Bank experience from the COVID-19 Multiphase Programmatic Approach,**[38] **and the Regional Disease Surveillance System Enhancement project (P167817), among others.** The Project also builds on the findings from key assessment studies from the World Bank and the European Centre for Disease Prevention and Control (ECDC)[39] on the impact of COVID-19 on the health sector. These lessons underscore the importance of proactive investment in preparedness, effective governance, institutions, and health workforce capacities, multisectoral collaboration, and strong data in building resilient health systems and responding effectively to pandemics. The key lessons learned that informed the design of the Project are outlined below.

36. **Investment in preparedness before pandemics pays off.** The World Bank assessment report, "Change Cannot Wait: Building Resilient Health Systems,"[40] recorded that countries like South Korea and Viet Nam, which invested in robust preparedness measures following previous Middle East Respiratory Syndrome and Severe acute respiratory syndrome outbreaks, were better equipped to respond to the COVID-19 pandemic. Early testing, identification, tracing, and isolation of cases were crucial in getting the disease under control in these countries.

[36] Climate Monitoring and Decision Support Framework for Sand Fly-borne Diseases Detection and Mitigation, https://climos-project.eu/.
[37] Health System Strengthening and Support Project (HSSSP); Türkiye Emergency COVID-19 Response Project; Türkiye Earthquake Recovery and Reconstruction Project; and Türkiye Pandemic Preparedness ASA.
[38] Multiphase Programmatic Approach.
[39] Lessons from the COVID-19 Pandemic, May 2023.
[40] World Bank. 2022. *Change Cannot Wait: Building Resilient Health Systems: Building Resilient Health Systems in the Shadow of COVID-19*. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/38233.

37. **Effective governance and institutions are crucial for the success of a country's response to a pandemic.** The World Bank assessment report highlights the importance of good governance in managing public health crises. It cites the example of South Korea, where the failure of governance during the Middle East Respiratory Syndrome epidemic led to the establishment of effective governance measures that ultimately contributed to the successful management of COVID-19.

38. **Complex implementation arrangements involving multiple implementing units jeopardize effective implementation.** The Project design builds on the lessons learned from the HSSSP, where many involving implementing General Directorates (GDs) and PMSU led to blurring of responsibilities towards achieving project objectives, complicating the supervision process, and causing delays in procurement. The design of this Project mitigates these risks by limiting the number of implementing units to three GDs and improving supervision through technical audits and addressing other capacity issues.

39. **Multisectoral coordination and partnerships are required for countries' resilience in the face of a pandemic.** The aforementioned World Bank report[41] also emphasizes that health emergency preparedness and response must reach far beyond the health sector and involve coordinated involvement of non-health actors. The OH approach adopted in countries such as China facilitated regional coordination and rapid country responses for diseases and allowed for sharing of real-time information and best practices for detection of cases.

40. **Workforce capacity building is critical for the success of pandemic preparedness.** The project design builds on the findings of the ECDC and assessments from the Regional Disease Surveillance System Enhancement project (P167817) regarding the need to build strong health workforce capacity at both national and regional levels. This includes training in preparedness, epidemiology, and health emergency simulations. Having enough trained public health staff is crucial for an effective response to a health crisis.

41. **Maintaining updated national and regional preparedness plans is critical for timely response to health emergencies.** Several of the projects and studies reviewed highlighted the importance of having updated and scalable preparedness plans incorporating lessons from past pandemics disseminated at all levels and adopted by policy makers.

42. **Strengthening data collection, analysis, sharing, and reporting are key for an effective early warning and surveillance system.** The ECDC report identified the need for digitalized surveillance systems and stronger information systems for timely analysis, interpretation, and presentation of epidemiological data tailored to the needs of policymakers and the public.

G. Corporate Priorities

43. **Gender.** The Project includes various actions to prevent and respond to GBV. As part of Subcomponent 2.3, the Project will ensure that GBV is addressed comprehensively in policies and plans on pandemic preparedness and response and will strengthen existing protocols, guidelines, and disaster response training to integrate actions to respond to GBV during the emergency and the recovery phase. Additionally, in the event that a Post-Disaster Needs Assessment is required, quantitative and qualitative data collected and used should clearly identify where differences exist between men and women, to support more nuanced and targeted gender-responsive decision-making processes for disaster recovery.

[41] *Change Cannot Wait: Building Resilient Health Systems: Building Resilient Health Systems in the Shadow of COVID-19*.

44. **Citizen Engagement**. The main beneficiaries of the capacity building and TA activities within the scope of the Project are health workforce and related MoH staff. The Project will establish a regular feedback mechanism pre- and post-satisfaction surveys for these beneficiaries to measure the effectiveness of the capacity building and enhancement efforts. Survey findings will be incorporated into the project documentation and will inform further Project activities. Feedback from these surveys will also help shape or revise the design and content of the TA and capacity building based on the actual needs of the recipients. Citizen engagement will be monitored through the following indicator: "Percent of the trainees who report satisfaction with the capacity building activities." The existing national Grievance Mechanism (GM) systems (SABIM – MoH Communication Centre, and SBN, the GM system for health workers) will be utilized for the Project and be strengthened to ensure feedback, consultation, and effective communication with stakeholders during the preparation and implementation phase. These GM systems will be widely publicized in project locations and offer an array of communication channels such as hotline, website, email, mail, and complaint boxes that will be adapted to beneficiaries' capacity and needs.

45. **Climate Change.** Türkiye is highly vulnerable to climate change and shocks; details of the Project's activities to adapt to and mitigate against climate shocks are detailed in Annex 3.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

46. **The Project will be implemented by the MoH as the key implementing agency, with support from the existing PMSU of the ongoing projects.** The MoH, which has the overarching responsibility for Türkiye's health sector and related policy oversight, will have fiduciary responsibility for the Project through its PMSU as an implementing entity responsible to ensure the technical implementation of all Project components with the relevant GDs, namely the GDs of Public Health, Public Hospitals, and Health Information Systems. The MoH has a proven track record as a committed and reliable partner. It has successfully implemented previous World Bank-financed projects, which contributed significantly to health sector reforms and strengthening the health system of Türkiye.

47. **Details on Project institutional and implementation arrangements will be set out in a POM.** The draft POM will be submitted to the Bank for review and No Objection as a condition of effectiveness of the Loan Agreement. Similarly, the CERC Manual and draft Emergency Action Plan will be submitted to the Bank for review and No Objection prior to disbursement of emergency expenditures under the CERC. The CERC Manual will outline detailed implementation arrangements related to the eligible crisis or emergency, including: (i) mechanism for activating the CERC; (ii) coordination and implementation arrangements; (iii) procurement, financial management (FM), and disbursement functions; (iv) compliance with Environmental and Social Framework; (v) monitoring and evaluation; and (vi) closing of the CERC.

48. **The PMSU and relevant GDs that are authorized by the MoH, will be responsible for overall fiduciary functions of the Project, including FM and procurement**. The PMSU is well established and includes core staff who are responsible for administrative and fiduciary management, and several technical staff who will coordinate activities under the Project. Additional technical staff will be hired by PMSU and relevant GDs to assist with Project activities as needed. All procurement under the Project will be undertaken by the PMSU/MoH through the relevant GDs.

B. Results Monitoring and Evaluation Arrangements

49. **The PDO-level and intermediate outcome indicators will be monitored regularly using routine reporting systems,** such as implementation support missions and preparation of implementation status and results reports. Project indicators have been selected on the basis of strong alignment to project activities and the PDO. Monitoring and evaluation

activities under the Project will be integrated into the regular monitoring functions of the MoH. Digital activities supported by the Project will contribute to improving the quality and reliability of the information obtained regularly by the MoH. The overall responsibility for monitoring and evaluation will rest with the MoH. The PMSU will be responsible for collating progress reports, monitoring key performance indicators and results in collaboration with relevant GDs, and providing information on implementation progress and results to the World Bank prior to each semi-annual implementation support mission. The reports shall present consolidated information on project performance, including physical and financial progress, social and environmental monitoring, gender and citizen engagement efforts, and results. The reports will also include data on grievances and respective resolutions to enable timely corrective action. The PMSU will also be responsible for coordinating reports on infrastructure, equipment, and staffing; these can be substantiated with photographic evidence and details regarding on-site visits.

C. Sustainability

50. **The sustainability of the activities supported by the Project can be assessed through two perspectives: institutional and technical sustainability**. Regarding institutional sustainability, the Government is committed to building its vaccine production capabilities and preparedness for PHEs. In the 12th National Development Plan for 2024-2028, the Government of Türkiye considers such preparedness a key priority in its health sector strategy against potential future outbreaks. With respect to technical sustainability, the Project contributes to the objectives by supporting the Government to enhance the health information systems for improved interoperability of early warning, surveillance, and laboratory systems within the daily routine work of health facilities. A substantial proportion of Project activities will therefore focus on training and TA to support these systems in detection of and response to PHEs.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical Analysis

51. The soundness of the overall Project design is reflected in its alignment with key health priorities and political commitments of the Turkish government and in its link to the global evidence that shows that simultaneous investments in health systems' resilience is critical for countries to build "emergency-ready health systems," which will improve health security and safeguard the lives and livelihoods of the population of Türkiye. Given that health system resilience is defined as the ability of a health system to mitigate, adapt to, and recover from shocks and stresses, the Project focuses on two main directions:

a. **Prevent and prepare**. By introducing investments in Türkiye's health and public health systems, the Project aims to strengthen the national health system capacity to prevent and prepare for health emergencies through strengthening the national vaccine manufacturing ecosystem to increase local vaccine production capacity and ensure access to vaccine supply for known and emerging infectious threats. Additionally, the Project will develop an updated national Health Emergency Preparedness plan that covers all hazards and incorporates linkages between human, animal, and environmental health by applying the OH approach to ensure engagement at all levels in the human-animal-environment health continuum.
b. **Detect and respond**. The Project aims to strengthen Türkiye's national and subnational capacities for detection of and response to health emergencies through strengthening of the surveillance system and public health intelligence at all levels to improve early and accurate detection of potential hazards and improving multisectoral coordination for OH that improves EWS', data sharing, and information exchange. Importantly, the Project will invest in national laboratory systems and diagnostics capacities to detect and monitor infectious and environmental hazards. Additionally, the Project plans to strengthen the coordination of emergency responses and service delivery, where it focuses on reinforcing governance of key capacities for emergency coordination

that include improved planning and prioritization, a well-trained workforce, access to necessary clinical hardware, and institutionalized coordination and governance.

52. **The Project is aligned with the goals of the Paris Agreement on both mitigation and adaptation.**

- **Assessment and reduction of mitigation risks.** All activities financed by this Project are universally aligned. Nonetheless, additional measures will be put in place to reduce GHG emissions resulting from vaccine production, including the use of the highest energy efficiency rating or labelling that allows quality vaccine manufacturing.
- **Assessment and reduction of adaptation risks.** Although the Project does not finance the construction of physical infrastructure, measures are in place to ensure that the equipment purchased under this Project will not be negatively impacted by climate hazards, such as flooding. An Environmental and Social Impact Assessment (ESIA) conducted on the VPC, which is considered an Associated Facility, identified climatic hazards and related interventions to reduce the risks to acceptable levels.

Economic Analysis

53. **Investments in PPR have been shown to be highly cost-effective, as they improve population health, which yields large economic returns.** Globally, pandemics have cost an estimated 4.8 percent of global GDP (approximately USD 3 trillion) in the 21st century. Notably, economies sensitive to outbreaks due to their reliance on tourism, agriculture, and manufacturing, stand to gain from improved pandemic readiness. Return on Investment (ROI) varies by pathogen, demographics, and mitigation strategies. Recent studies indicate ROI values ranging from USD 34 to USD 1,703 for COVID-like pandemics, USD 42 to USD 968 for SARS-like pandemics, and USD 4 to USD 415 for Spanish-flu-like pandemics. Additionally, net benefits in terms of GDP loss averted span from 0 percent to 12 percent. This Project's aggregate development impact is expected through several channels. First, the primary direct impact of epidemics presented in interference with the basic economic processes of production and trade and the devastation of human capital. Evidence shows that global losses due to the COVID-19 pandemic were estimated at 5.5 to 8.7 percent of world GDP in 2020 and 3.6 to 6.3 percent of world GDP in 2021.[42] Secondary effects, such as additional losses of human capital, occur through the outbreak's interference with basic public service functions such as health and education system functions. For instance, the COVID-19 pandemic created a climate of fear and contributed to the unprecedented scale of disruptions of delivery and uptake of immunization services. About 23 million children around the world missed out on basic vaccines through routine immunization services in 2020, according to official data published by WHO and UNICEF.[43] Moreover, further analysis shows that the direct annual medical cost of COVID-19 in Türkiye was estimated at PPP USD 2.1 billion. The COVID-19 pandemic resulted in a direct medical burden corresponding to 2 percent of the Government's health expenditures and 0.08 percent of Türkiye's GDP.[44]

B. Fiduciary

Financial Management

54. **The residual FM risk of the Project is assessed as Moderate.** The MoH has extensive experience in World Bank FM requirements and has had satisfactory FM arrangements for ongoing as well as recently closed projects. Overall FM arrangements related to staffing, budgeting, financial reporting, internal control and internal auditing, flow of funds, and audits are deemed adequate to provide reasonable assurance on the proper use of project funds for achievement of the PDO. The FM responsibilities will be centralized at the PMSU, and the relevant participating GDs will be responsible for all

[42] Sawada, Y., and Lea R. Sumulong. 2021. "Macroeconomic Impact of COVID-19 in Developing Asia." ADBI Working Paper 1251. Tokyo: Asian Development Bank Institute. https://www.adb.org/publications/macroeconomic-impact-covid-19-developing-asia.
[43] WHO. 2021. "COVID-19 Pandemic Leads to Major Backsliding on Childhood Vaccinations."
[44] Oksuz, E., Simten Malhan, Mustafa Sait Gonen, Zekayi Kutlubay, Yilmaz Keskindemirci, Fehmi Tabak. 2021. "COVID-19 healthcare cost and length of hospital stay in Türkiye: Retrospective analysis from the first peak of the pandemic." *Health Economics Review* 11(1): 39. https://doi.org/10.1186/s13561-021-00338-8.

stages of procurement. The current FM staff at the PMSU are experienced and have the required qualifications; they will be responsible for the coordination of FM of the Project and providing support to the implementing GDs. The MoH will manage project disbursement through traditional disbursement methods, including advances, direct payments, special commitments, reimbursement, and designated account. The PMSU will tailor the accounting system currently in use to follow up fund flows on a cash basis in the currency of the loan and produce the data necessary to prepare the Interim Unaudited Financial Statements. The Project will submit quarterly Interim Financial Reports (IFRs) to the World Bank using the same templates used for ongoing projects. Annual audits of the project financial statements will be carried out by Treasury Controllers. Audit periods may be combined, depending on the actual dates of project implementation, upon agreement with the World Bank. The main FM covenants for the Project are:

- The MoH will maintain a FM system acceptable to the Bank.
- The MoH will prepare the interim unaudited financial reports for the Project on a quarterly basis and submit these to the Bank no later than 45 days after the end of each period.
- The project financial statements will be audited by independent auditors acceptable to the Bank with terms of reference acceptable to the Bank. The annual audited financial statements of the project will be submitted to the Bank within six months of the end of the fiscal year.

Procurement

55. **The residual procurement risk is determined to be Substantial.** World Bank Procurement Regulations for IPF Borrowers, dated September 2023 (Procurement Regulations) shall apply to the Project**.** The Bank's "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants," (revised as of July 01, 2016) ("Anticorruption Guidelines") shall also be applicable. Procurement under the Project is expected to include a variety of goods, works, and consultant services contracts. The expected types of procurement, procurement methods, market approaches and mitigation measures are provided in Annex 4.

56. **Procurement under the Project is expected to include mostly goods and consultant services**. With respect to goods, these include such as high value/complex technical and medical equipment for the operation of the Ankara VPC. Consultant services involve hiring of firms for providing TA in areas such as prioritizing the research agenda for vaccine manufacturing technologies, strengthening of laboratory systems, updating the preparedness plan, and strengthening the capacity of the health workforce and some individual technical and fiduciary consultants to support the PMSU and GDs namely the GDs of Public Health, Public Hospitals, and Health Information Systems, that are authorized by the MoH for the implementation of the relevant components under the project. These will be procured through open competitive procedures under international and national market approach as appropriate. Any exceptions such as for use of non-competitive procedures, engagement of serving civil servants (with or without leave of absence without pay) under consultant contracts, etc. will require strong justification and subject to the conditions of eligibility and conflict of interest set out in the Procurement Regulations. No works are expected to be procured under the Project.

57. **The PMSU and relevant GDs will be responsible for procurement under all components and subcomponents of the Project.** To enable efficiency, economy of scale, and minimize the administrative burden of procuring, the PMSU and GDs that are authorised for implementation of the respective components and subcomponents under the project will conduct the procurement with the support of the relevant departments. The PMSU will be responsible for using the Systematic Tracking of Exchanges in Procurement (STEP) system to plan, record, and track the procurement transactions. Further details of the procurement arrangements are provided in Annex 4 (Fiduciary Arrangements).

C. Legal Operational Policies

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

58. **The environmental risk rating for the Project after mitigation is rated Substantial.** This is firstly due to the potential risks related to the construction and operation of biosafety level-three VPC in Ankara, including impacts of the implementation of large-scale construction works, and biological safety of storing, experimenting, researching, and production of vaccines. While the Project will not support the construction of the VPC, it will procure equipment and laboratory supplies for the VPC. Thus, VPC has been classified as an Associated Facility to the Project and subject to the Environmental and Social Standards due diligence, considering construction and operation phases. The other groups of risks will relate to: (i) minor refurbishment and operation of laboratories to be strengthened and equipped under the Project, and the Ankara SEUM; (ii) TA to identify vaccine manufacturing technologies that, in the future, will inform and guide the vaccine production processes at VPC; and (iii) operational health and safety and personal protection during the refurbishment, construction, and operation of VPC and other research and training facilities to be refurbished and equipped under the project. The risks and impacts of the Ankara VPC construction and operation are analyzed and addressed under the Ankara VPC draft ESIA and Environmental and Social Management Plan, developed within the scope of the recently closed HSSSP (P152799). The ESIA was disclosed and consulted from May 2 to May 20, 2024, and final version furnished to the Bank on June 21, 2024, including consultation feedback; the final version was disclosed by the Bank in July 2024. The environmental risks associated with minor refurbishment and equipping of laboratory facilities will be addressed by incorporating relevant provisions of the WBG Environmental, Health and Safety Guidelines and references to WHO Laboratory Manual into the POM and respective technical specifications. The terms of reference for the TA determining vaccine production technologies will envisage tasks on analyzing, assessing, and managing potential E&S risks associated with proposed technologies.

59. **The social risk for the Project after mitigation is Moderate**. The moderate risk classification is based on the nature and scale of the project investments, which do not include major infrastructure (or new construction of laboratories and VPCs), land acquisition with resettlement and livelihoods impacts, or activities which pose risks to human health. The Project's social risks and impacts can be mitigated through implementation of Good International Industry Practices in the health sector. Hence, adverse risks and impacts are residual due to poor implementation of the required measures, such as unintended spread of infectious diseases due to improper infection prevention control and disease containment. Also, the construction of the biosafety level-3 VPC, which is considered an Associated Facility, may result in some labor and working condition risks and impacts. Activities may also involve minor refurbishment works for the establishment of the Ankara SEUM, which is already a designated area managed by public authorities and, hence, considered as public land with no prior use by private individuals for livelihood activities. There is also a minor risk related to the exclusion of certain beneficiaries or stakeholders from project benefits due to inadequate consultation in designing the planned interventions. Most project activities are in the form of TA and will be implemented at the central level. There will be no labor influx or major civil works. No testing on humans as part of surveillance and vaccine development will take place.

60. **The draft Ankara VPC ESIA and Environmental and Social Management Plan include measures to prevent infections and diseases, manage labour and working conditions risks and impacts, and provide for assignment of relevant staff to manage these risks.** The MoH has prepared a Stakeholder Engagement Plan to ensure that all relevant stakeholders are engaged with in a structured and planned manner. A Labor Management Procedure is also prepared to set out policies to manage relevant labour risks of the Project. The relevant E&S requirements are reflected in the Environmental and Social Commitment Plan. The Environmental and Social Commitment Plan, Labor Management Procedure, and Stakeholder Engagement Plan documents have been finalized as drafts and were disclosed and consulted by the MOH between May 2 and 20, 2024, and disclosed by the Bank in July 2024.

V. GRIEVANCE REDRESS SERVICES

61. **Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank noncompliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's GRS, visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's AM, visit https://accountability.worldbank.org.

VI. KEY RISKS

62. **The overall residual risk of the Project is considered Substantial**. This is due to institutional capacity for implementation and sustainability, fiduciary, and E&S risks being rated as Substantial, whereas the political and governance, macroeconomic, sector strategies and policies, technical design, and stakeholder risks are rated as Moderate. Fiduciary risks are mainly due to large and complex procurement activities, and environmental and social risks are due to the construction and operation of biosafety level-3 VPC in Ankara. Fiduciary risks are mitigated by clearly defining procurement implementation structures and engaging a technical audit consultant to provide specific technical guidance to ensure timely completion of critical procurements for the VPC. Environmental and social risks will be addressed by incorporating relevant provisions of the World Bank Group's Environmental, Health and Safety Guidelines and references to the World Health Organization's Laboratory Manual into the Project Operations Manual and respective technical specifications. The fiduciary and E&S risks and their mitigation measures are further discussed earlier in Sections B and D, respectively. The procurement risks and their mitigation measures are detailed in Annex 4. The institutional capacity for implementation and sustainability risk and related mitigation measures are discussed below. The risk ratings will be monitored and assessed during implementation and revised as necessary.

63. **Institutional capacity for implementation and sustainability risk is rated Substantial.** The PMSU and MoH have substantial experience in implementing World Bank-financed projects. Risks stem mainly from: (i) the large number of GDs implementing project activities, which would require close coordination and follow-up to expedite the decision-making process; (ii) MoH capacity to simultaneously work on multiple activities including World Bank-financed Türkiye Earthquake Recovery and Reconstruction Project, and other development partners and International Financial Institutions; and (iii) constraints related to the mobilization of additional suitably skilled labor for the MoH – for example, procurement, FM, E&S specialists – in the post-disaster context. These aspects may lead to delays in implementation. To mitigate any possible risks, several actions will be taken by the World Bank and MoH teams, including: (i) limit the number of GDs implementing

project activities to three, thus simplifying coordination and follow up; (ii) the Bank will engage a technical audit consultant to conduct on-site audits and also to review the implementation/completion status in terms of quality and quantity of procurements; (iii) the Bank and PMSU will increase supervision and support accountability of GDs through setting clear deliverables, expenditure projections, and timelines for implementation; and (iv) clearly define the procurement implementation structure in the POM, including roles and responsibilities for internal and externally hired staff, and operational procedures.

VII. RESULTS FRAMEWORK AND MONITORING

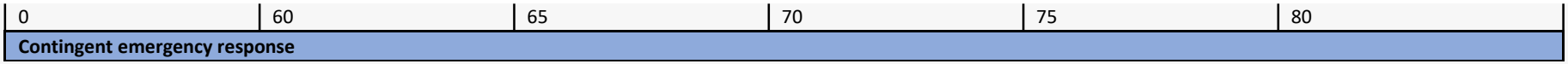
PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Period 3	Period 4	Closing Period
Strengthen vaccine production capacity					
VPC produces at least one vaccine which (i) receives authorization from Türkiye's NRA, TMMDA, and (ii) is subsequently submitted to WHO for Pre-Qualification (Text)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
Ankara VPC is not operational	N/A	N/A	VPC receives authorization from Türkiye's National Regulatory Authority (NRA)	N/A	A Vaccine Prequalification Dossier (VPQD) is submitted to WHO
Strengthen national and subnational capacities for detection of and response to health emergencies					
Percent of events of public health concern with all rapid response actions completed within seven days. (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	10	30	55	60	65

Intermediate Indicators by Components

Baseline	Period 1	Period 2	Period 3	Period 4	Closing Period
Strengthen vaccine production capacity					
Percent of VPC staff trained (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	0	15	25	35	50
➢No of VPC staff trained (number) (of which women, percentage) (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	46	49	50	60	70
Strengthen national and subnational capacities for detection of and response to health emergencies					
Number of national and subnational hazard risk assessments completed (Number)					
May/2024	May/2025	May/2026	Oct/2027	May/2028	Oct/2029

0	0	1	1	2	2
Number of provinces that have completed their all-hazards health emergency preparedness plans (Number)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	0	10	20	35	60
Interval between date of emergence and date of detection of potential hazards (Days)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	0	0	15	10	7
The national all-hazards health emergency preparedness plan includes protocols to respond to GBV during emergencies (Yes/No)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
No	No	Yes	Yes	Yes	Yes
Share of cases that are confirmed by laboratory analysis (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
68	70	70	75	80	90
Share of confirmed cases with complete patient information (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
30	33	35	40	50	60
Number of drills and simulation exercises conducted (cumulative) (Number)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	0	5	10	15	20
➢Number of drills and simulation exercises conducted, (of which related to women's health, %) (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	0	20	50	60	75
Health workers with the knowledge to identify and refer GBV survivors to health, justice, and protection services during public health emergencies (Number)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	100	300	400	500	600
Microbial Pathogens Covered by National Genome Sequence Surveillance (Number)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
4	5	6	7	8	9
Project management and monitoring, and institutional capacity					
Percent of trainees who report being satisfied with the capacity building activities (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029
0	65	70	70	75	80
Percent of grievances addressed within the stipulated timeframe (Percentage)					
May/2024	May/2025	May/2026	May/2027	May/2028	Oct/2029


0
60
65
70
75
80
Contingent emergency response

Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Strengthen vaccine production capacity	
VPC produces at least one vaccine which (i) receives authorization from Türkiye's National Regulatory Agency, the Turkish Medicines and Medical Devices Agency, and (ii) is subsequently submitted to WHO for Pre-Qualification.	
Description	This is a qualitative indicator measuring the progress made for the Ankara VPC for WHO vaccine PQ. Intermediate steps are defined as follows: - VPC receives authorization from Türkiye's NRA - A Vaccine Prequalification Dossier (VPQD) is submitted to WHO
Frequency	Annual
Data source	MoH
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH – PMSU

Strengthen national and subnational capacities for detection of and response to health emergencies	
Percent of events of public health concern with all rapid response actions completed within seven days.	
Description	This indicator measures the agility of the system to initiate a rapid response action within seven days. An **event of public health concern** is defined as an event that poses immediate threat to human health and requires public health action (e.g. disease control measures). A **rapid response action** includes the following activities: - Investigation initiated. - Epidemiologic analysis done. - Risk assessment made. - Lab confirmation obtained. - Case management in place. - Infection Prevention and Control in place. **Numerator:** number of events detected by the system with all rapid response actions completed within seven days. **Denominator:** total number of events detected by the system.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Strengthen vaccine production capacity	
Percent of VPC staff trained (Percentage)	
Description	This indicator measures the progress made on the capacity building and training of VPC staff Numerator: number of VPC staff trained. Denominator: total number of VPC staff.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH
No of VPC staff trained (number) (of which women, percentage) (Percentage)	
Description	This indicator measures the progress made on the capacity building and training of women VPC staff
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Strengthen national and subnational capacities for detection of and response to health emergencies	
Number of national and subnational hazard risk assessments completed (Number)	
Description	This indicator measures the progress made in the national and sub national risk assessment studies. The hazards for which the risk assessments will be done include geological, hydrological and biological hazards and climate change risks and hazards, as indicated below: 1. Landslides 2. Coastal floods/hazards 3. Flash floods 4. Storms 5. Heatwaves 6. Cold waves 7. Droughts 8. Wildfires 9. Airborne diseases 10. Waterborne diseases 11. Vector borne diseases 12. Insect infestation etc.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Number of provinces that have completed their all-hazards health emergency preparedness plans (Number)	
Description	This indicator measures the progress made to prepare health emergency preparedness plans on the provincial level.

Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH - PMSU
Responsibility for Data Collection	MoH

Interval between date of emergence and date of detection of potential hazards (Days)	
Description	This indicator measures the time passed between the date of emergence and date of detection Date of emergence **is defined as:** i. For endemic diseases: date on which a predetermined increase in case incidence over baseline rates occurred. ii. For non-endemic diseases: date on which the index case or first epidemiologically linked case first experienced symptoms. iii. For other public health events: date the threat first met criteria as a reportable event based on country reporting standards. **Date of detection is defined as**: the date the event is first recorded by any source or any system.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

The national all-hazards health emergency preparedness plan includes protocols to respond to GBV during emergencies (Yes/No)	
Description	This gender-specific indicator aims at ensuring that the national all-hazards health emergency preparedness plan includes explicit protocols to respond to GBV during emergencies and address immediate physical and safety needs of women such as separate toilets, and sanitation activities.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Share of cases that are confirmed by laboratory analysis (Percentage)	
Description	This indicator measures the case confirmation capacity of the laboratory networks. **Numerator:** number of cases confirmed by laboratory analysis. **Denominator:** total number of cases sent for the laboratory analysis.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for	MoH

Data Collection	

Share of confirmed cases with complete patient information (Percentage)	
Description	This indicator measures the extent to which information systems are able to integrate case information with patient information. **Numerator:** number of confirmed cases with complete patient information. **Denominator:** total number of confirmed cases.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Number of drills and simulation exercises conducted (cumulative) (Number)	
Description	This indicator measures the progress in organizing drills and simulation exercises which would help to strengthen skills to be used in real life threats.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH
Number of drills and simulation exercises conducted, (of which related to women's health, %) (Percentage)	
Description	This indicator measures the progress in organizing drills and simulation exercises related to women which would help to strengthen skills to be used in real life threats.
Frequency	Annual
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU
Responsibility for Data Collection	MoH

Health workers with the knowledge to identify and refer GBV survivors to health, justice, and protection services during public health emergencies (Number)	
Description	This gender-specific indicator measures the number of health workers who acquired, with project support, the knowledge to identify and refer GBV survivors to health, justice, and protection services during public health emergencies.
Frequency	Annual
Data source	Pre- and post-training assessments, MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU. The progress in health workers' knowledge will be measured through pre- and post-training assessments.
Responsibility for Data Collection	MoH

Microbial Pathogens Covered by National Genome Sequence Surveillance (Number)	
Description	This indicator measures the capability of the genomic sequence surveillance system to detect microbial pathogens

Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH - PMSU
Responsibility for Data Collection	MoH

Project management and monitoring, and institutional capacity	
Percent of trainees who report being satisfied with the capacity building activities	
Description	This citizen engagement indicator measures the share of trainees who report satisfaction with the capacity building activities supported by the project. Numerator: number of trainees who reported satisfaction with the capacity building activities. Denominator: total number of people benefitting from capacity building activitites supported by the project.
Frequency	Annual
Data source	Post-training assessments
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU. The progress will be measured through post-training assessments.
Responsibility for Data Collection	MoH

Percent of grievances addressed within the stipulated timeframe	
Description	This citizen engagement indicator measures the share of grievances received by the project that were addressed within the stipulated timeframe. Numerator: number of grievances received by the project that were addressed within the stipulated timeframe. Denominator: total number of grievances received by the project.
Frequency	Annual
Data source	MoH administrative records
Methodology for Data Collection	Technical reports and progress reports of the MoH – PMSU.
Responsibility for Data Collection	MoH

ANNEX 1: Implementation Arrangements and Support Plan

1. **Institutional and implementation arrangements build upon existing structures and systems, to the extent possible**. The Project will be implemented by the MoH through the existing PMSU that is implementing the ongoing Emergency COVID-19 Response Project (P173988) and GDs authorized by the MoH for the implementation of the project.

2. **The PMSU and GDs authorized by the MoH for the project implementation, will be responsible for overall fiduciary functions of the Project, including FM and procurement**. The PMSU will support day-to-day project management and implementation and will be responsible for procurement, FM, and reporting on the use of project funds. The PMSU will also oversee preparation of the consolidated annual workplan, procurement plan, and a consolidated activity and financial report for the project components and will assist the MoH in monitoring compliance with Bank environmental and social standards (ESS) and fiduciary policies. The existing PMSU is adequately staffed and is composed of a project director, a deputy director, seven monitoring and evaluation experts, four procurement specialists and assistants, three FM specialists and assistants, three administrative personnel, four information technology specialists, and three translators. Additional staff will be hired to assist with project activities, as needed. Short- or long-term technical support will be provided as may be required during implementation with the objective of building capacity within the MoH and its technical agencies. All procurement under the Project will be undertaken by the PMSU and GDs that are authorized by the MoH for the implementation of the respective components and sub-components. The PMSU will report regularly to the Minister of Health, who is the signing authority of the Project.

3. **The directors of the participating GDs of the MoH – Public Health, Public Hospitals, and Health Information Systems – will be responsible for the technical implementation of project subcomponents and activities**. These GDs will implement technical activities, including procurement of Goods, Works, Non-consultant and Consultant Services for the implementation of the components and sub-components. Selected activities, such as coordination, communication, and training may be outsourced to third parties through contract agreements, if needed.

4. **The other key agency, which will have an important role during project implementation, is the Ministry of Treasury and Finance**. It is responsible for oversight of the budget execution.

5. **More details on the Project's institutional and implementation arrangements will be set out in the POM.** This manual will clearly describe the roles, responsibilities, and processes to be carried out during project implementation.

Table A1.1. Implementation responsibilities by components

#	Component	Implementing Unit
Component 1. Strengthen vaccine production capacity		
	Vaccine production capacity	GD Public Health
Component 2. Strengthen national and subnational capacities for detection of and response to health emergencies		
2.1	Early warning and surveillance	GD Public Health, GD Health Information Systems
2.2	Laboratory and diagnostics systems	GD Public Health, GD Health Information Systems
2.3	Improved planning and emergency response coordination for emergency-ready health systems	GD Public Health, GD Health Information Systems, GD Public Hospitals
Component 3. Project management and monitoring, and institutional capacity		
Component 4. CERC		

Table A1.2. Implementation Support Plan by Period

Period	Focus	Skills needed	Staff weeks (annual)
Years 1-2	Overall technical and operational support	Task Team Leaders	20
		Operations Officer	
	Implementation of PPR activities (labs and surveillance)	Health Specialist	2
	Implementation of health information system activities	HIS Specialist	4
	FM	FM Specialist	2
	Procurement	Procurement Specialist	2
	Environmental risk management	Environmental Specialist	2
Years 3-6	Overall technical and operational support	Task Team Leaders	20
		Operations Officer	
	Implementation of PPR activities (labs and surveillance)	Health Specialist	2
	Implementation of health information system activities	HIS Specialist	5
	FM	FM Specialist	2
	Procurement	Procurement Specialist	2
	Environmental risk management	Environmental Specialist	2

ANNEX 2: Detailed Project Costing (USD, million)

COMPONENT 1: Strengthen vaccine production capacity	**150**
COMPONENT 2: Strengthen national and subnational capacities for detection of and response to health emergencies	**92**
Subcomponent 2.1. Early warning and surveillance	*24*
Subcomponent 2.2. Laboratory and diagnostics systems	*13*
Subcomponent 2.3. Improved planning and emergency response coordination for emergency-ready health systems	*55*
COMPONENT 3: Project management and monitoring, and institutional capacity	**8**
COMPONENT 4: Contingent Emergency Response (CERC)	**0**
Front-end fee	
TOTAL	**250**

ANNEX 3: Overview of Climate-related Activities

Vulnerability Context

1. **The Project has been screened for climate risks and is highly exposed, while risks to project activities are low.** Türkiye's primary climate hazards and risks are floods, landslides, storms, droughts, and extreme heat. Floods account for 29 percent of all naturally occurring hazards, and storms and extreme heat account for 7 and 5 percent, respectively. The frequency and intensity of storms, floods, droughts, and wildfires has increased over the last two decades.[45] The country's geographic and socioeconomic conditions make it particularly vulnerable to climate change.[46] Without any intervention, the country is estimated to lose approximately 2.26 percent of its GDP by 2050 due to climate change.[47]

2. **Climate change and natural hazards have profound implications for human health in Türkiye**. Frequent climate change-induced high temperature extremes and increase in the number of hot days have exacerbated the current chronic conditions and led to new ones, worsening the noncommunicable disease (NCD) burden in the country. NCDs are the leading cause of death and disability combined in Türkiye, 70 percent of which are climate sensitive.[48] Specific populations in Türkiye, particularly the elderly – 65 years old and above – and children, especially those from poor and urban areas, are disproportionately affected by extreme heat. For instance, during 1961–1990, deaths due to heat-related causes among the elderly were approximately 5.2 deaths per 100,000 population; this is projected to increase to 62 deaths per 100,000 population by 2080.[49] Extreme temperatures leading to heat waves between 2013-2019 resulted in 441 excess deaths across Istanbul and other parts of the country.[50, 51] Climate impacts have also affected the agriculture sector, with evidence suggesting an associated increase in food insecurity.[52] Increase in annual temperatures, frequent severe drought events, and reduction in annual precipitation have significantly affected agricultural productivity with a noticeable reduction in crop yields and livestock production, impacting malnutrition in the country.[53, 54] Food insecurity in Türkiye ranges from 22 percent to 69 percent in the general population and climate change is worsening the current situation.[55] In August 2021, torrential rains and related flash floods in the wildfire-prone northern province of Türkiye led to the deaths of at least 17 people, severely damaged roads, bridges, and power infrastructure and led to evacuation of a regional hospital, causing health service delivery disruption in the flood-prone areas.[56, 57]

3. **Increased precipitation, temperature, and other meteorological conditions have led to environmental changes that affect vector patterns and access to clean water, driving increased risks of many priority infectious threats,**

[45] Neira, M., Kamil Erguler, Hesam Ahmady-Birgani, Nisreen DaifAllah AL-Hmoud, Robin Fears, Charalambos Gogos et al. 2023. "Climate change and human health in the Eastern Mediterranean and Middle East: Literature review, research priorities and policy suggestions." *Journal of Environmental Research* 216 (Part 2): 114537. https://doi.org/10.1016/j.envres.2022.114537.
[46] World Bank Group. 2022. *Turkey Country Climate and Development Report*.
[47] G20 CLIMATE RISK ATLAS: Impacts, policy, economics: Türkiye.
[48] Institute for Health Metrics and Evaluation (IHME). Türkiye. https://www.healthdata.org/research-analysis/health-by-location/profiles/Türkiye
[49] WHO and UNFCCC. 2022. "Health and Climate Change Country Profile 2022."
[50] Ümit Şahin, Uğurcan Sayılı, Marjolaine Dubé, Beril Kara, Hazal Cansu Acar,* Barış İnan, Özden Aksu Sayman, Germain Lebel, Ray Bustinza, Hüseyin Küçükali, Umur Güven, and Pierre Gosselin. 2019. "Excess Mortality in Istanbul during Extreme Heat Waves between 2013 and 2017." *International Journal of Environmental Research and Public Health* 16(22): 4348. doi: 10.3390/ijerph16224348.
[51] Ozturk et al. 2023. "The Impacts of Heat Waves on Hospital Admissions and Mortality in the Fethiye Province of Turkey."
[52] Şeker et al. 2020. *The Report on Climate Change and Public Health in Turkey*.
[53] Tanchum. M. 2023. "Climate Change Threatens Türkiye's Role as a Food Supplier to Europe and the Middle East." *The Turkey Analyst*, July 18, 2023.
[54] WHO and UNFCCC. 2022. "Health and Climate Change Country Profile 2022."
[55] Aytekin Sahin, G., and Ozge Mengi Celik. 2024. "Evaluation of food insecurity and associated factors in women of childbearing age: A community-based study from Türkiye." *Food Science & Nutrition* 12(1): 154-161. https://doi.org/10.1002/fsn3.3743.
[56] Reuters. 2021. "Heavy floods hit northwest Türkiye killing 17 people." CNN.com, August 13, 2021.
[57] Agence France Presse (AFP). 2021. "Turkish Hospital, Villagers Evacuated in Flash Floods." August 11, 2021.

including vector-borne, waterborne, and zoonotic diseases.[58] Evidence from Türkiye shows that an increase in waterborne diseases in the country is linked to the use of contaminated water sources, water shortages, and inadequate access to proper sanitation and hygiene services during floods and droughts, especially in climate-vulnerable areas.[59, 60] Climate change is already impacting the emergence and re-emergence of vector-borne disease in Türkiye and the prevalence of West Nile fever, Rift valley fever, Crimean-Congo hemorrhagic fever and Sandfly fever is projected to increase with climate change.[61]

4. **Climate-driven population displacement further increases the risk of emergence and spread of all infectious diseases with limited health system capacity to accommodate population needs.** Increased mortality and emergency department visits in some regions have also been associated with an increase in air temperature.[62] Addressing these downstream impacts has a substantial financial and economic burden. For instance, a 10 percent reduction in water supply has cost the country six percent of its GDP,[63] and droughts will further reduce water supply by approximately 46.9 percent by 2050,[64]with further expected downstream health impacts.

Climate Activities

5. **The Project intends to implement measures to adapt to the impacts of climate change, primary floods, in Türkiye**. Climate hazards are a major driver of health emergencies in Türkiye, estimated to directly account for at least 45 percent of all natural disasters in the country between 1980 and 2020—floods, 28.89 percent; landslides, 8.15 percent; storm, 6.67 percent; extreme temperatures, 5.19 percent.[65] Projections show that by end of the century, Türkiye is expected to experience an average annual temperature increase of 4.9°C, and total annual precipitation will decrease. Therefore, an increase in the frequency of heavy precipitation events is anticipated, with significant impacts on climate-sensitive NCDs, vector- and waterborne diseases, food security and malnutrition, and resultant impacts on the health system and health service delivery. Considering this vulnerability context, the Project intends to implement the following activities to adapt to the impact of climate change and mitigate against GHG emissions.

[58] National Adaptation Plan – Türkiye.
[59] Reliefweb. (1999, August 27). "Türkiye: Water and Sanitation, surveillance systems now key to disease control." Press Release WHO/44, August 27, 1999.
[60] WHO and UNFCCC. 2022. Health and Climate Change Country Profile 2022.
[61] Negev, M., Shlomit Paz, Alexandra Clermont, Noemie Groag Pri-Or, Uri Shalom, Tamar Yeger, and Manfred S. Greens. 2015. "Impacts of Climate Change on Vector Borne Diseases in the Mediterranean Basin — Implications for Preparedness and Adaptation Policy." *International Journal of Environmental Research and Public Health* 12 (6): 6745-6770. https://doi.org/10.3390/ijerph120606745. .
[62] Oray et al. 2018. "The impact of a heat wave on mortality in the emergency department."
[63] World Bank Group. 2022. *Turkey Country Climate and Development Report*.
[64] G20 CLIMATE RISK ATLAS: Impacts, policy, economics: Türkiye.
[65] World Bank. 2021. "Türkiye – Historical Hazards."

Table A3.1: Climate Adaptation and Mitigation Activities

Component	Climate Action
Component 1: Strengthen vaccine production capacity (USD 150 million equivalent)	
	This component will finance the continued development of the Ankara VPC. The VPC will produce vaccines that are in demand based on country need, such as vaccines for climate-sensitive diseases, including Tetanus, Polio, and Measles vaccines, to address the huge burden of the climate-sensitive diseases in the country. In addition to being a national distributor of vaccines, the VPC will also export vaccines to other countries in the region. The component will finance (i) TA to determine the manufacturing technologies, and (ii) train VPC staff **(adaptation)**. Aligned with Criteria 9.1 of the 'Buildings, public installations and end-use energy efficiency' section of the of the Multilateral Development Bank Mitigation Finance Methodology, the Project commits to adopting measures that substantially reduce net energy consumption, resource consumption, and CO2e emissions for the installation of vaccine production equipment, which will include minor rehabilitation measures such as interior and mechanical equipment installation, electrical wiring, and installation of lighting. Aligned with criteria 9.2 "Energy efficiency, renewable energy, CO2e emission reduction, and carbon sinks in green buildings" the Project commits to securing post-rehabilitation EDGE level-1 certification for installation of vaccine production equipment and minor rehabilitation. The work is estimated to cost USD 77 million. The Project will finance TA for energy efficiency assessments and implementing the EDGE building criteria, which will center around low embedded GHG emissions in the building materials used, thermal protection and low emissivity of the building envelope and glazing and passive energy design with active or passive façade shading elements as appropriate for the vaccine production facility. The design and rehabilitation of the energy-efficient vaccine production facility will contribute to reductions in GHG emissions. **(mitigation)."** Aligned with Criteria 9.5 of the Multilateral Development Bank Mitigation Finance Methodology, electrical vaccine-production equipment purchased through this subcomponent for health facilities will apply energy-efficiency standards to ensure substantial reduction of energy consumption, resource consumption, or CO_2e emissions compared to the current context in Türkiye, where such guidelines are currently not consistently implemented. This demonstrates the GHG substantiality of this component, as this introduces the use, and thereby surpasses, national standards. By introducing the use of energy efficiency requirements into equipment specifications, the Project goes above and beyond current technology performance benchmarks. Energy Star efficiency standards, IEC energy efficiency standards, and similar viable standards for medical equipment will be used, exceeding mandatory minimum energy-performance standards set in Türkiye, with particular reference to IEC 60601-1-9, "Medical Equipment - General requirements for basic safety and essential performance - Collateral Standard: Requirements for environmentally conscious design." The highest energy-efficiency rating or labelling that allows quality vaccine manufacturing will be pursued. Rated criteria will be used in the procurement process to ensure that the highest energy-efficiency rating or labelling that allows to perform quality vaccine manufacturing will be pursued. The cost of this electrical vaccine-production equipment[66] will be an estimated USD 68 million from IBRD. The project will also finance USD 77 million in installation and design of the equipment, which will integrate measures to maximize energy efficiency in all aspects of the installation process (**mitigation**).

[66] Total medical equipment is estimated at USD 2.5 million and is anticipated to compose electrical equipment such as scanners and anesthesia machines, among others.

Component 2: Strengthen national and subnational capacities for detection of and response to health emergencies (USD 92 million equivalent)	
Subcomponent 2.1: Early warning and surveillance (**USD 24 million**)	This subcomponent will take specific actions to improve early warning and surveillance systems for climate-sensitive diseases and to better understand the impact of climate change on these diseases, as follows: a. **Prioritization and planning for greater impact:** the national and subnational hazard risk assessments will cover climate shocks as a primary focal area under non-biological hazard mapping (along with geophysical hazards), given their primacy among shocks in the country. Climate sensitive diseases, such as Crimean-Congo Hemorrhagic Fever and AMR pathogen, will be included under priority pathogens. Specific assessment materials will be used for climate shocks and climate sensitive diseases, which will help the health system prepare for climate shocks and respond to the additional burden of disease from climate change. b. **System performance, expansion, and improvement:** Climate change is a primary impetus and focus of the three activities under this subcomponent (improving events-based surveillance; enhancing vector surveillance; and adoption of advanced data science and analytics), which will use meteorologic data to better understand the impacts of climate change on infectious diseases and to address the additional burden of disease as well as changing transmission dynamics due to climate change. Specifically: i. **Improving events-based surveillance** will use meteorologic data to more effectively detect outbreaks of climate-sensitive diseases and to better understand the impact of climate change on outbreaks of climate sensitive diseases. ii. **Enhancing vector surveillance** will strengthen response to climate-sensitive diseases given the link between vector-borne diseases and climate change. iii. **Adoption of advanced data techniques** will prioritize the use of meteorologic data to better understand the impact of climate change on climate-sensitive diseases. c. **Workforce skills:** The subcomponent will finance the training of healthcare workers on climate emergency preparedness and response. Climate change is one of the four focal areas and will include specific modules on climate change emergency preparedness and response (**adaptation).** d. **Critical hardware:** The subcomponent will finance digital equipment, such as computers. Aligned with Criteria 9.5 of the Multilateral Development Bank Mitigation Finance Methodology, equipment purchased through this subcomponent for the digital health will apply energy-efficiency standards to ensure substantial reduction of energy consumption, resource consumption, or CO_2e emissions compared to the current context in Türkiye, where such guidelines are currently not consistently implemented. The cost of this digital health equipment including computers will be an estimated USD 2 million from IBRD. This demonstrates the GHG substantiality of this project component, as this introduces, and thereby surpasses, national standards. By ensuring incorporation of energy-efficiency requirements into equipment specifications, the Project goes above and beyond current technology performance benchmarks. Energy-efficiency standards will be used, exceeding implementation of mandatory minimum energy-performance

	standards in Türkiye, with particular reference to the energy star criteria. Rated criteria will be used in the procurement process to ensure that the highest energy efficiency rating or labelling that allows to perform digital health services adequately will be pursued (**mitigation**). e. **Information systems and data:** Leveraging an existing Memorandum of Understanding between the MoH and the metrological department, this subcomponent will finance the integration of meteorologic data into the surveillance system to improve the understanding of and planning to prevent climate-sensitive diseases (vector-borne, water-borne, and zoonotic diseases). This will help the health system more effectively respond to the impacts of climate change on these climate-sensitive diseases (**adaptation**).
Subcomponent 2.2: Laboratory and diagnostics systems (USD 13 million).	The subcomponent will purposively integrate activities to strengthen capacity for climate-sensitive disease (vector-borne, water-borne, and zoonotic diseases) diagnostics throughout this subcomponent. a. **Improved planning:** Preparedness response plans will be prepared for climate-sensitive diseases (water- and vector-borne diseases) and will include dedicated sections on the climate-specific impacts on the diseases (e.g.: flooding-related transmission) and responding to the diseases during climate shocks. b. **System performance and improvement:** Workflow optimization will include protocols for handling and transporting of specimens during shocks, with a primary focus on climate shocks. c. **Workforce skills:** Laboratory staff will be trained in climate emergency preparedness and response, with a focus on maintaining sample integrity during climate shocks and testing samples for climate-sensitive disease outbreaks. Specific modules on climate emergency preparedness and response will be used for the trainings. d. **Critical hardware:** The subcomponent will finance digital equipment, such as computers. Aligned with Criteria 9.5 of the Multilateral Development Bank Mitigation Finance Methodology, equipment purchased through this subcomponent for the digital health will apply energy-efficiency standards to ensure substantial reduction of energy consumption, resource consumption, or CO_2e emissions compared to the current context in Türkiye, where such guidelines are currently not consistently implemented. The cost of this digital health equipment, such as computers, will be an estimated USD 1.2 million from IBRD. This demonstrates the GHG substantiality of this project subcomponent, as this introduces, and thereby surpasses, national standards. By ensuring incorporation of energy-efficiency requirements into equipment specifications, the Project goes above and beyond current technology performance benchmarks. Energy-efficiency standards will be used, exceeding implementation of mandatory minimum energy performance standards in Türkiye, with particular reference to the energy star criteria. Rated criteria will be used in the procurement process to ensure that the highest energy efficiency rating or labelling that allows to perform digital health services adequately will be pursued (**mitigation)**.

Subcomponent 2.3 National planning and emergency response coordination for emergency-ready health systems (USD 55 million).	Climate change is a primary focus and impetus throughout these activities. In total this subcomponent will focus on planning and preparing for outbreaks, climate shocks, and humanitarian emergencies, including earthquakes. a. **National preparedness and response planning**: This subcomponent will finance the update of the 2019 National Influenza Plan to a National All Hazards Health Emergency Preparedness Plan. Climate change is a primary impetus and one of the three primary focal areas for this emergency preparedness plan, which includes infectious diseases outbreaks (including outbreaks of climate-sensitive diseases), and humanitarian emergencies, such as earthquakes. Climate change fueled shocks (storms, high temperatures, and floods) comprised 41 percent of all natural hazards in the country between 1980 and 2020, landslides and epidemics, which are, in part, climate change fueled, comprised 8.15 and 2.22 percent respectively. Taken together it is estimated that climate change comprises at least 45 percent of all health emergencies. The National All-Hazards Health Emergency Preparedness Plan will have specific sections on health system response to the country's climate shocks (floods, storms, high heat, climate-sensitive diseases, landslides). The activity will also finance TA to review and validate the plan **(adaptation)**. This subcomponent will support developing national and subnational (facility-level) plans to strengthen operational readiness. This includes protocols for all-hazards emergency response operations, decision trees and workflows, roles and responsibilities, and hazard-specific planning. Climate change is a primary driver and one of the three focal areas for these preparedness and response plans, which are climate shocks, infectious disease outbreaks, including climate-sensitive diseases, and humanitarian emergencies, such as earthquakes. b. **Workforce skills and system performance improvement:** i. Multidisciplinary response teams and front-line health care workers will be trained on climate change emergency preparedness and response through specific modules on these topics to improve their ability to effectively respond to these shocks. Climate change is one of the three areas to be covered in the trainings which will include: outbreaks, climate shocks, and humanitarian emergencies, including earthquakes. ii. Simulations, tabletop exercises, and drills will include dedicated exercises on climate change emergency preparedness and response to improve readiness for climate change exacerbated shocks, improving adaptive capacity. Climate change is one of the three main areas to be covered, which are: outbreaks, climate shocks, and humanitarian emergencies, including earthquakes. c. **Critical hardware:** This subcomponent will finance digital equipment, such as computers. Aligned with Criteria 9.5 of the Multilateral Development Bank Mitigation Finance Methodology, equipment purchased through this subcomponent for the digital health will apply energy-efficiency standards to ensure substantial reduction of energy consumption, resource consumption, or CO_2e emissions compared to the current context in Türkiye, where such guidelines are currently not consistently implemented. The cost of this digital health equipment such as computers will be an estimated USD 2 million from IBRD. This demonstrates the GHG substantiality of this project component, as this

	introduces, and thereby surpasses, national standards. By ensuring incorporation energy-efficiency requirements into equipment specifications, the Project goes above and beyond current technology performance benchmarks. Energy-efficiency standards will be used, exceeding implementation of mandatory minimum energy performance standards in Türkiye, with particular reference to the energy star criteria. Rated criteria will be used in the procurement process to ensure that the highest energy-efficiency rating or labelling that allows to perform digital health services adequately will be pursued **(mitigation).** **d. Coordination and governance:** Climate change is one of the primary focal areas and impetuses for this activity and will be incorporated through a dedicated focus on legislation, regulations, information sharing, and OH activities. Climate change relevant ministries, including environment and meteorologic services, will be included in the multisectoral coordination and communication platform.
Component 3: Project Management and Monitoring, and Institutional Capacity (USD 8 million equivalent)	
Component 3: (USD 8 million equivalent) Project Management and Monitoring, and Institutional Capacity	This component will monitor the Project's climate mitigation and adaptation aspects and should be assessed at the same rate as the Project's other climate activities. (**adaptation and mitigation**).

6. **The Project will monitor the progress of the planned activities to adapt to the impact of climate change and mitigate GHG emissions during the implementation of project activities**.

ANNEX 4: Fiduciary Arrangements

Financial Management

1. **The residual FM risk of the Project is assessed as Substantial.** Overall FM arrangements related to staffing, budgeting, financial reporting, internal control, and internal auditing, flow of funds, and audits are deemed adequate to provide reasonable assurance on the proper use of project funds for achievement of the PDO. The MoH is a general budget institution, subject to the Public Financial Management and Control Law No. 5018.

2. **Implementing entity and staffing.** The PMSU in the MoH will be responsible for the coordination of the respective components, including FM functions. The GDs of Public Health, Information Systems, and Public Hospitals, and the PMSU will be the implementing GDs and will conduct the technical activities. The PMSU team responsible for the Project's FM arrangements are very experienced and have satisfactory qualifications. They will perform tasks related to coordination of planning and budgeting, accounting, financial reporting, disbursement, ensuring application of internal controls, and work with the external auditors during the audit of financial statements.

3. **Planning and budgeting.** The investments proposed to be financed by the World Bank loan are included in the annual investment program. The MoH will coordinate with Strategy and Budget Office to ensure inclusion of the Project in the investment program and allocation of sufficient budget allocations to cover project expenditures over the life of the Project. The Project's budget will be prepared by MoH and coordinated by the PMSU. Variances between actual and budgeted figures will be monitored on a regular basis, appropriately analyzed, and corrective actions taken. The PMSU will prepare in-year financial plans and cash forecasts based on the Project's budget, thus ensuring adequate liquidity management and withdrawal of funds.

4. **Accounting system.** The project expenditures will be recorded in the government's financial reporting system in Turkish Liras and in the PMSU's accounting system in Euros and in Turkish Liras. The accounts kept in the government system are subject to the Public Financial Management and Control Law No. 5018. The PMSU's accounting system, used for the HSSSP and COVID-19 projects, will also be used for this Project. The software has adequate security levels and the IFRs as well as the year-end financial reports will be automatically generated from the system.

5. **Internal controls.** At the MoH, the PMSU is responsible for the FM of currently active World Bank-financed projects. The PMSU functions are overseen by the Minister of Health, to whom the PMSU Director reports. The MoH implementing units (GDs) are responsible for budgeting and executing their own investments and preparing the documentation for processing of the related payments, whereas the accounting and reporting for the project is the responsibility of the PMSU. The accounting entries to the system maintained by the PMSU are made based on the payment confirmation of the Central Bank of the Republic of Türkiye. The PMSU has installed an integrated payment monitoring system where several stages of the procurement processes are recorded. These entities must include the serial number provided by the system in preparing the payment order which is required for processing the payment from the designated account at the Central Bank. The serial number is assigned by the system only after the required information (to which the PMSU has online access) is entered. The accountants in the PMSU also reconcile journal vouchers with the Central Bank of the Republic of Türkiye records on a regular basis. The same internal control procedures will be adopted for this Project.

6. **Financial reporting.** The IFRs will be prepared by the PMSU on a quarterly basis and will be submitted to the Bank no later than 45 days after the end of the quarter. The agreed formats of the IFRs will be attached to the minutes of negotiations and they will be similar to the ones used by the MoH for the current projects under implementation and recently closed.

7. **External audit.** The Project financial statements that will be prepared by the PMSU will be subject to external and independent auditing. The first set of audit reports will be submitted to the Bank before June 30th of the year following the calendar year in which the first disbursement from the loan has been made. The project financial statements will be audited by the Treasury Controllers in accordance with International Auditing Standards. The terms of reference for the audit will be attached to the minutes of negotiations. The project financial statements are required to be made publicly available in accordance with the World Bank Access to Information Policy and guidelines. The following chart identifies the audit reports and their due dates:

Type of Audit Report	Due Date
Project Financial Statements for MoH	Within six months after the end of each calendar year, and at project closing.

8. **Funds flow and disbursement arrangements.** There will be one designated account for the Project. All payments to contractors, suppliers and consultants will either be made directly from the loan account or from the designated account with the authorization of the responsible personnel. Traditional disbursement methods will be utilized.

9. **The loan proceeds will be disbursed by the World Bank in line with the World Bank Disbursement Guidelines for Investment Project Financing (dated February 2017)**, using traditional disbursement methods including the advance, direct payment, reimbursement, and special commitment disbursement methods. The Ministry of Treasury and Finance will open a designated account for MoH at the Central Bank of the Republic of Türkiye. Additional detailed procedures will be included in the Disbursement and Financial Information Letter. Full documentation in support of Statement of Expenditures will be retained by the Implementing Agency for at least seven years after the Bank has received the audit report for the fiscal year in which the last withdrawal from the Loan Account was made. This information will be made available for review during supervision by Bank staff and for annual audits.

10. **FM supervision.** During project implementation, the Bank will supervise the Project's FM arrangements in MoH as follows: (i) during the Bank's supervision missions, FM and disbursement arrangements will be reviewed to ensure compliance with the Bank's minimum requirements, and (ii) project's quarterly interim un-audited financial reports as well as the project's annual audited financial statements and auditor's management letter will be reviewed.

Procurement

11. **The PMSU and relevant GDs will undertake responsibility for project implementation, including procurement**. The PMSU is experienced in carrying out World Bank-financed projects but may need additional capacity support for handling the large value/complex procurement of goods under the Project. The relevant GDs, current internal administrative and management arrangements for handling procurement, established for the HSSP, COVID-19, and TERRP projects, will be replicated for this Project. Both PMSU and GDs that are authorized by the MoH for implementation of the project will also ensure that an adequate number of qualified government procurement staff are assigned on full-time basis for the Project to carry out the Project's procurement, with additional support, if required, provided by hiring of external procurement consultants.

12. **The Project Procurement Strategy for Development and Procurement Plan are currently being prepared by PMSU and will be reviewed by the Bank**. The plan will set out the estimated costs, applicable procurement methods, and market approaches based on the market analysis carried out by the PMSU, the Bank's review requirements, timelines, and the GD responsible for each procurement package. The Project Procurement Strategy for Development will form the basis for establishing the procurement risks and mitigation measures at project preparation stage. In addition to the activity-wide procurement plans to be submitted in STEP, a holistic annual procurement plan will be required to be submitted for the Bank's approval at the beginning of each year and efforts will be made to consolidate similar

procurement requirements into smaller number of larger size procurement packages to enable the government to avail cost savings based on economy of scale and reduce the administrative burden.

13. **The STEP will be used for all procurement-related correspondence between PMSU and the Bank**, including procurement plans and documentation of all procurement transactions for post- and prior-review contracts under the Project, which must be promptly uploaded in STEP.

14. **Procurement categories**. The bulk of procurement under the Project is expected to involve goods related to medical and technical equipment required for the operation of the Ankara VPC, most of which will be procured through open international bidding. Some smaller-value goods and non-consultancy services may be procured through open national bidding and Request for Quotation. No procurement of works is envisaged.

15. **Advance procurement**. To avoid delays in project implementation and avail financial savings, advance procurement actions will be carried out. Advance procurement will be used for the key procurement packages, such as the consultancy services for the preparation of preliminary designs and bidding documents for the VPC and SEUM. Advance procurement actions can include all steps in the selection process proceedings but not including contract award. Since the contract will be awarded and signed immediately after the loan effectiveness, advance procurement does not entail any contractual obligation or financial commitment of the implementing agency to the selected consultant/contractor/supplier.

16. **Complaint-handling mechanism.** The Project is required to ensure recording of procurement-related complaints in the STEP system. The World Bank and MoH will use STEP to track complaints. MoH will be responsible for performing the following actions in STEP: (a) promptly record all complaints relating to procurement process; (b) for procurement process complaints received on contracts subject to the World Bank's prior review, submit MoH's proposed response to each complaint before issuing it to the complainant(s); (c) record MoH's response to the procurement process complaints upon issuance to the complainant(s); and (d) promptly register requests for debriefings and update STEP with the record of the debriefings to interested parties. Procurement-related complaints arising in connection with contracts where the World Bank's Standard Procurement Documents are required to be used will be handled in accordance with Annex III of the Procurement Regulations.

17. **Procurement under the CERC.** It was agreed that, once CERC is triggered, MoH will prepare a separate procurement plan based on the emerging priority needs at the time. Given that the CERC is contingent and event-driven, no procurement plan for the CERC can be prepared in advance with streamlined procurement arrangements applicable under emergency situations under the CERC. The World Bank's oversight and due diligence for procurement will be done through augmented implementation support with close monitoring and enhanced procurement-related post review.

18. **Procurement supervision frequency.** The World Bank's team will supervise procurement throughout the procurement cycle under the Project. In the planning stage, this will include reviewing the procurement arrangements, contract packaging, applicable procedures, and scheduling of procurement processes in conformity with the Bank's Procurement Regulations. During implementation, large-value, high-risk, and/or critically important procurement packages will be subject to the Bank's prior review. Other procurement will be subject to post review on a sampling basis. Procurement progress and performance will be reviewed as part of the Bank's supervision at least every six months.

19. **Procurement risk and mitigation measures.** The residual procurement risk is determined to be Substantial. The key risks and mitigation measures are listed below. These will be reviewed during the project implementation phase as part of the Bank's supervision and updated as appropriate.

Table A4.1. Identified Procurement Risks and Agreed Action Plan

Action No.	Identified Risk	Mitigation Measure	Responsible Party	Time Frame
1.	Delay in start of procurement processes due to lack of completion of technical prerequisites (technical designs, specifications, TORs, E&S requirements), and not initiating advance procurement during project preparation phase.	• Close coordination by PMSU with the participating GDs in the technical preparation of activities • Holistic annual procurement plan, using template provided by the Bank, to include key milestone dates for completion of technical prerequisites preceding the procurement process. • Quarterly monitoring reports on the progress of technical preparation activities. • Undertake advance procurement actions (except contract signing) during project preparation phase.	PMSU and Respective GDs	During Project preparation and throughout implementation.
2.	Inefficiency and lack of cost-effectiveness due to splitting similar procurement requirements into multiple procurement packages tendered concurrently.	• Preparation of holistic annual procurement plan to identify the inter-relationship between the procurement packages and opportunities for consolidation. • Consolidating similar procurement requirements into smaller number of larger value procurement packages to enable cost savings for the government through economy of scale and reduce administrative burden.	PMSU and Respective GDs	Procurement Planning stage.
3.	Capacity constraint of the client for managing the technical preparation, procurement, and contract supervision of high value complex goods.	• Enhancing the capacity of the PMSU and relevant GDs by appointing full-time qualified technical and procurement government staff to the Project, with additional support, if required, provided by individual consultants.	PMSU and Respective GDs	In the first 12 months of the implementation.
4.	Low competition and fluctuations in local market prices/currency.	• Conducting market sounding. • Increasing competition through use of open international bidding wherever appropriate. • Allowing bid prices and payments in foreign currencies even in open national procurement.	PMSU and Respective GDs	At project preparation and throughout implementation.
5.	Delays in the procurement process and contract	• Specifying in the textual part of the project procurement plan and in the POM, time standards for completion of key stages of the procurement process,	PMSU and Respective GDs	At project preparation and throughout implementation.

	signing leading to slow disbursement	including bid evaluation and contract signing. • Submission of Quarterly Monitoring Reports on procurement progress and performance against the approved procurement plan.		
6.	Potential wrongdoing by bidders.	• Highlighting the Bank's integrity requirements and complaints procedures in the bidding documents and through preproposal meetings. • Carrying out due diligence during the bid evaluation process and checking the debarment lists of the Bank and Government to confirm eligibility of bidders prior to awarding any contract.	PMSU and Respective GDs	Throughout project implementation.

ANNEX 5: Economic Analysis

1. **There is a strong economic case for investing in pandemic preparedness and response.** Preventing and controlling disease outbreaks yields large economic benefits by reducing the threats of epidemics and pandemics beyond the health benefits of reducing the number of infections, reducing mortality, morbidity, and health care costs. Disease outbreaks affect economic activity by decreasing demand on one hand due to the drastic decrease in personal income, accompanied with a fall in investment and exports, and decreasing supply on the other hand due to the decrease in agriculture production and the closure of businesses in many sectors. This is in addition to the reduced availability of labor, capital, and productivity, which are the major components of growth.[67] The economic impacts of severe pandemics have been estimated at 4.8 percent of global Gross Domestic Product (GDP), approximately USD 3 trillion in the 21st century.[68] The Turkish economy, characterized by a large share of sectors sensitive to outbreaks, such as tourism, agriculture production, and manufacturing, would greatly benefit from the better preparedness and response to pandemics that the Project will support.

2. **Evidence highlights that the ROI of pandemic preparedness may show large variations depending on the type of pathogen, the affected country, its demographics, and the mitigation strategies applied.** For instance, a recent study shows that the ROI of pandemic preparedness in terms of value of years of life lost averted per USD 1 spent ranges USD 34–1,703 for a COVID-like pandemic, USD 42–968 for a SARS-like pandemic, and USD 4–415 for a Spanish-flu-like pandemic; the more severe the pandemic, the higher the ROI. Moreover, the same study shows that the net benefits of pandemic preparedness in terms of GDP loss averted ranges 0–12 percent of GDP.[69]

3. **This project's aggregate development impact will primarily stem from strengthening Türkiye's capacity to prevent, detect and respond to future epidemics and public health risks, and from strengthening the service delivery systems and investing in primary and secondary health care, digital technology, and data, together with building capacities of healthcare workforce.** Each of these factors is expected to have an economic impact through several channels.

4. **The primary direct impact of epidemics is their interference with the basic economic processes of production and trade and the devastation of human capital.** Evidence shows that global losses due to the COVID-19 pandemic were estimated at 5.5–8.7 percent of the world GDP in 2020 and 3.6–6.3 percent of the world GDP in 2021.[70] These impacts largely originate from declines in domestic demand and tourism, and from global spillovers.

5. **Secondary effects, such as additional losses of human capital occur through the outbreaks' interference with basic public service functions, such as health and education system functions.** For example, COVID-19 pandemic and resultant chaos created a climate of fear and contributed to the unprecedented scale of disruptions of delivery and uptake of immunization services. About 23 million children around the world missed out on basic vaccines through routine immunization services in 2020, 3.7 million more than in 2019, according to official data published by WHO and UNICEF.[71] Available literature highlights different factors that affected immunization coverage during the pandemic, including

[67] UNDP. 2014. *Assessing the Socio-Economic Impacts of Ebola Virus Disease in Guinea, Liberia, and Sierra Leone: The Road to Recovery*. New York: UNDP.
[68] "A single severe flu pandemic could cost US$3 trillion. It is hard to imagine a more severe threat to ending absolute poverty or to boosting shared prosperity in developing countries." See Jonas, Olga B. 2013. "Pandemic Risk." Background Paper on for the World Development Report 2014 on *Risk and Opportunity: Managing Risks for Development*. Washington, DC: World Bank.
[69] Center For Global Development. 2023. "What is the Return on Investment of Pandemic Preparedness?"
[70] Sawada, Y., and Lea R. Sumulong. 2021. "Macroeconomic Impact of COVID-19 in Developing Asia."
[71] WHO. 2021. "COVID-19 Pandemic Leads to Major Backsliding on Childhood Vaccinations."

vaccine and health workforce availability, concerns of exposure to COVID-19 infection, and restrictions of movements due to lockdowns.[72]

6. **Regarding schooling, the COVID-19 pandemic led to physical school closures and a transition to online learning.** While such closures were common across the world, their duration was different across and within countries. Evidence from research carried out in the first stages of the pandemic pointed to negative results, rising inequalities, and potential long-term gaps in learning. Moreover, multiple studies found evidence of an increase in the attainment gap between students from different socioeconomic backgrounds, differences in results between public and private schools, and that children from lower socioeconomic backgrounds had fewer opportunities to engage in learning activities.[73] Additionally, one of the most eye-opening research findings indicated that, in the absence of any remedial measures and catching up, the pandemic would leave a permanent effect on the educational achievements of a whole generation and, among other negative effects, lead to worse future job prospects and lower earnings.[74] Moreover, worldwide evidence shows that inequality has also been deepened through food insecurity during the pandemic when school meals could not be provided, especially to vulnerable students. According to the UNICEF and World Food Programme, about 388 million children across the world received daily meals in schools prior to the pandemic, whereas at the height of school closure in early 2020, 370 million children were missing out on school meals.[75]

7. **Moreover, further analysis shows that the direct annual medical cost of COVID-19 in Türkiye was estimated at PPP US$2.1 billion.** The COVID-19 pandemic resulted in a direct medical burden that corresponds to 2.0 percent of the government health expenditures and 0.08 percent of Türkiye's GDP.[76] Moreover, the pandemic has already had negative impacts on the continuity of health services whose implied costs in terms of morbidity and mortality are non-negligible. Therefore, it is safe to conclude that containing outbreaks before they turn into pandemics has tremendous positive externalities at the global level.

8. **Improving the access to and quality of primary health care services—for example, through ensuring the provision of vaccines, basic healthcare products, and prevention and control of NCDs—leads to reductions in morbidity, mortality, and improvements in financial protection.** Essential and affordable care that is widely accessible is a fundamental component in building and maintaining human capital, which contributes to a population's productivity, and manifests in economic growth. In terms of direct costs and benefits of primary healthcare services, there is evidence that increased investment in primary care can reduce use of both secondary and tertiary care and reduce overall health costs,[77] represented in decrease in funds spent on hospitalizations, prescriptions, and common tests and procedures.[78] Evidence also suggests that primary care can improve population health in terms of life expectancy and maternal, infant, and

[72] Lassi, Z. S., Rabia Naseem, Rehana A Salam, Faareha Siddiqui, and Jai K. Das. 2021. "The Impact of the COVID-19 Pandemic on Immunization Campaigns and Programs: A Systematic Review." *International Journal of Environmental Research and Public Health* 18 (3): 988. DOI: 10.3390/ijerph18030988.

[73] European Commission. 2022. "Impacts of COVID-19 on School Education. Publications Office of the European Union." Luxembourg: Publications Office of the European Union. https://data.europa.eu/doi/10.2766/201112.

[74] Gambi, L., and Kristof De Witte. 2021. "The Resiliency of School Outcomes After the COVID-19 Pandemic. Standardized Test Scores and Inequality One Year After Long Term School Closures." Working Papers of LEER. Discussion Paper Series DPS21.12. Leuven, Belgium: KU Leuven (Department of Economics). https://lirias.kuleuven.be/3611628?limo=0.

[75] UNICEF. 2020. "Futures of 370 Million Children in Jeopardy as School Closures Deprive Them of School Meals – UNICEF and WFP." https://www.unicef.org/press-releases/futures-370-million-children-jeopardy-school-closures-deprive-them-school-meals.

[76] Oksuz et al. 2021. "COVID-19 healthcare cost and length of hospital stay in Türkiye: Retrospective analysis from the first peak of the pandemic."

[77] Friedberg, M. W., Peter S. Hussey, and Eric C. Schneider. 2010. "Primary Care: A Critical Review of the Evidence on Quality and Costs of Health Care." *Health Affairs (Millwood)* (29): 766–72. DOI: 10.1377/hlthaff.2010.0025.

[78] Harrold, L. R., Terry S. Field, and Jerry H. Gurwitz. 1999. "Knowledge, Patterns of Care, and Outcomes of Care for Generalists and Specialists." *Journal of General Internal Medicine* (14): 499–511. DOI:10.1046/j.1525-1497.1999.08168.x.

neonatal mortality.[79] There is also evidence of large economic benefit from the combination of strengthening pandemic preparedness and primary health care services. For example, the return on investment from childhood immunizations in lower-middle-income countries has been estimated as USD 44 for each USD 1 spent.[80]

9. **Actions on strengthening capacities of health workforce, digital technology, and data will improve service delivery and enable the population to access better health services in a timely manner.** Access to better care will result in decrease of mortality and morbidity. Additionally, investing in the enhancement of digital health systems will enable the early detection of and response to health emergencies.

10. **Public sector interventions are justified from an economic perspective if market failures exist and there are interventions that correct them without imposing costs on society that exceed the benefits.** Examples of market failures include:

a. **The presence of externalities.** When external costs or benefits are not automatically factored into the choices of individuals, this results in costs higher than the anticipated benefits. During pandemics and health shocks there are always negative externalities, which is a market failure that justifies, in principle, a public-policy intervention with the aim of improving social welfare.
b. **Insufficient and asymmetrical information.** During pandemics and health shocks, people do not usually have access to all the relevant information in a timely manner, as access to information is affected by different variables such as socioeconomic status, education, and other variables. Imperfect information is common where the health effects of an intervention are insufficiently understood and researched, for example, because of the long-time lag between an intervention and outcome, and where industry's marketing efforts distort information, intentionally or otherwise. Overall, government intervention in the form of the provision and production of health information is, in principle, justifiable, as information is a public good; the absence of government intervention therefore likely leads to its undersupply.
c. **Time-inconsistent preferences or "internalities."** In some situations, individuals give in to the temptation to accept immediate gratification at the expense of their long-term best interests. The solution to time-inconsistent preferences is to provide individuals with effective commitment devices. Given their enforcement power, governments are generally in a good position to invest in preparing for pandemics and strengthening the resilience of the health systems, especially when it is not common that individuals would choose to invest in preparing for pandemics.

11. **Therefore, governments need to step in to build a resilient health system that can deliver effective pandemic prevention, preparedness, and response.** This is expected to yield economic benefits by lowering health sector costs and improving the health of the population in the form of a significant reduction in disabilities and premature mortalities while it addresses the three main forms of market failure mentioned above.

12. **The World Bank brings substantial value added through its ability to draw from knowledge and operational track record on building resilient health systems.** The Bank has extensive experience working with countries to strengthen the resilience of their health systems and preparedness to respond to public health emergencies and threats. For instance, the Bank responded to the health and economic impact of COVID-19, shared relevant experience, and advised on the high standards required to facilitate further investment in health systems preparedness through the Multiphase Programmatic Approach, the dedicated COVID-19 response program that has served 79 countries to date.

[79] Perry, H. B., Bahie M. Rassekh, Sundeep Gupta, and Paul A. Freeman. 2017. "Comprehensive review of the evidence regarding the effectiveness of community-based primary health care in improving maternal, neonatal and child health: 7. shared characteristics of projects with evidence of long-term mortality impact." *Journal of Global Health* 7 (1): 010907. DOI: 10.7189/jogh.07.010907.
[80] Ozawa, S., Samantha Clark, Allison Portnoy, Simrun Grewal, Logan Brenzel, and Damian G. Walker. 2016. "Return On Investment From Childhood Immunization In Low- And Middle-Income Countries, 2011–20." *Health Affairs (Millwood)* (35): 199–207. DOI: 10.1377/hlthaff.2015.1086.