

# Healthcare in Egypt

Digital Egypt Pioneers Initiative – DEPI

Data Analysis

Finally, Team

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# Executive Summary

## The idea of project:

Our project focuses on evaluating the healthcare sector in Egypt from the perspective of patients and everyday citizens who frequently use medical services. Since any developing country aiming to grow must strengthen its key sectors—healthcare, education, and food security—we chose to analyze the current challenges within the Egyptian healthcare system. Our goal is to understand citizens' satisfaction, identify common issues, and highlight areas that need improvement based on real public feedback.

## Data Source:

The data for this project was collected directly from citizens through a **Google Form survey**. The survey aimed to gather feedback on their experiences with the healthcare system, including satisfaction levels, common challenges, and usage patterns of different healthcare providers. This data set serves as the foundation for our analysis, enabling us to identify trends and insights from real public responses.

## **General Objective:**

The main objective of this project is to **highlight the shortcomings and gaps in the healthcare experience in Egypt**. By analyzing citizens' feedback, the project aims to provide a clear, data-driven understanding of the challenges faced by patients and identify areas that require improvement.

The analysis for this project was carried out using the following tools:

- **Python** – for data cleaning and preprocessing.
- **SQL** – for querying and exploring the dataset.
- **Power BI** – for visualizing insights and creating interactive dashboards.

# Methodology

The project's methodology is structured around three main stages: **planning and design, implementation, and analysis**. In the **planning phase**, the primary goal was defined as measuring patient satisfaction and identifying weaknesses across the entire healthcare experience—from appointment booking to follow-up. The target population includes patients (or companions) who received healthcare services within a defined period. The sampling approach was also determined, using either systematic random sampling or stratified sampling to ensure fair representation of different patient categories. Sample size was defined based on the population size, a 95% confidence level, and a 5% margin of error.

During the **implementation phase**, the focus was on selecting the most appropriate data-collection method, such as face-to-face interviews, online surveys, or evaluation kiosks. Ethical considerations were emphasized, including informed consent, confidentiality, and voluntary participation. A **pilot test** with a small group of patients was also conducted to identify any unclear questions or technical issues before launching the survey on a wider scale.

In the **analysis and reporting phase**, quantitative data (such as rating-scale items) were analyzed using tools like Excel or SPSS to calculate averages, percentages, and the main areas of concern. Qualitative data from open-ended questions were categorized and grouped to highlight recurring themes. A final report is then prepared, supported by clear charts and visuals, presenting the key findings and offering practical, actionable recommendations for improving the patient's experience.

# Introduction

This project focuses on evaluating the healthcare sector in Egypt from the perspective of patients and regular citizens who frequently use medical services. Healthcare, along with education and food security, is one of the key sectors that any developing country must strengthen to grow and compete globally.

Egypt's healthcare system has faced recurring challenges for many years, which makes it an important area for analysis. By collecting real feedback directly from citizens through a **Google Form survey**, our team aims to highlight the main shortcomings, understand citizens' satisfaction, and identify areas that require improvement.

The main objective of this project is to provide a **clear, data-driven understanding of the healthcare experience in Egypt** and offer insights that can guide future improvements.

# **Research Questions**

This project aims to answer several key analytical questions regarding the healthcare experience in Egypt, including:

- 1. What is the overall satisfaction level of citizens with healthcare services?**
- 2. How does waiting time before consultation affect patient satisfaction?**
- 3. Are healthcare facilities perceived as clean and well-organized?**
- 4. How easy is it for citizens to book appointments, and does this impact their satisfaction?**
- 5. What are the most common challenges faced by patients in the healthcare system?**

These questions guide the analysis and help identify areas that require improvement to enhance the quality of healthcare services in Egypt.

# Dataset Description

## Data Source:

The dataset was collected through a **public survey on Google Forms** to gather citizens' feedback on their experiences with the healthcare system in Egypt.

## Number of Records and Columns:

- **Records (Rows):** 202
- **Columns:** 47

## Key Columns:

The dataset includes multiple columns covering different aspects of healthcare services. The most important ones are:

- **Waiting time before consultation**
- **Cleanliness of healthcare facilities**
- **Organization of departments**
- **Overall satisfaction**
- **Easy of appointment booking**

## Purpose of the Dataset:

The dataset provides a solid foundation for analyzing citizens' experiences, identifying trends, and highlighting areas that require improvement in the Egyptian healthcare system.

## نموذج استطلاع خاص بالرعاية الصحية

نشكرك على تخصيص وقتكم للمشاركة في هذا الاستبيان الذي يهدف إلى قياس مستوى رضا المرضى وتحسين جودة الخدمات الصحية المقدمة في منشآت الصحية

جميع إجاباتك سرية تماماً وستُستخدم لأغراض تطوير الخدمة فقط، ولن تؤثر بأي شكل على رعايتك الطبية.

الاستبيان يستغرق حوالي 5-7 دقائق للإجابة، ساهم برأيك لمساعدتنا على تقديم خدمة أفضل لك ولجميع المرضى في المستقبل.

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Not shared

\* Indicates required question

# Data Cleaning (Python)

The dataset underwent a thorough cleaning process using **Python**, which included the following steps:

## 1. Handling Missing Values:

- Missing values were removed, particularly from **open-ended questions**, to ensure data quality.

## 2. Removing Duplicates:

- Duplicate records were identified and deleted to avoid redundancy in the analysis.

## 3. Fixing Data Types:

- Data types were corrected for all relevant columns, including numeric, categorical, and date/time fields.

## 4. Adjusting Time Stamps:

- Time-related columns were standardized to ensure consistency in format and accuracy.

## 5. Categorizing Open-Ended Questions:

- Responses from open-ended questions were grouped into predefined **categories** to facilitate analysis.

This cleaning process ensured that the dataset was accurate, consistent, and ready for further analysis in SQL and visualization in Power BI.

## Before:

After:

AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
الحساسية-النظافة_المسراة_هل هناك طرارة-الدفع														اقتراحات
2	2	4	4	2	3	3	3	2	4	4	4	5	5	3
4	لا	3	2	نعم	3	3	2	لا شيء	لا شيء	لا شيء	لا شيء	5	5	3
5	نعم	5	3	نعم	4	5	4	لا شيء	لا شيء	لا شيء	لا شيء	4	5	5
5	نعم	5	5	نعم	5	5	5	لا شيء	لا شيء	لا شيء	لا شيء	5	5	5
5	نعم	5	5	نعم	4	5	3	لا شيء	لا شيء	لا شيء	لا شيء	4	5	3
2	لا	3	3	لا	2	3	3	لا شيء	لا شيء	لا شيء	لا شيء	2	3	2
4	نعم	3	4	لا	5	3	3	لا شيء	لا شيء	لا	لا شيء	3	4	1
1	نعم	1	1	نعم	5	1	3	لا شيء	لا شيء	لا شيء	لا شيء	1	5	1
5	نعم	5	3	نعم	5	5	4	لا شيء	لا شيء	لا شيء	لا شيء	5	5	3
5	نعم	5	5	نعم	5	5	5	لا شيء	لا شيء	لا شيء	لا شيء	5	5	4
5	نعم	5	4	نعم	4	5	4	لا شيء	لا شيء	لا شيء	لا شيء	5	5	5
5	نعم	5	5	نعم	5	5	5	لا شيء	لا شيء	لا شيء	لا شيء	5	5	5
5	نعم	4	4	نعم	4	4	4	لا هي جيدة كلا شيء	الراحة	لا شيء	لا شيء	4	4	4
3	لا	3	1	لا	2	2	1	لا شيء	لا شيء	لا شيء	لا شيء	1	2	1
3	لا	2	3	نعم	3	1	1	لا شيء	لا شيء	لا شيء	لا شيء	5	5	3
4	نعم	4	5	نعم	5	5	4	لا شيء	وقت الانتظار كل شيء	لا شيء	لا شيء	4	4	4
3	لا	3	1	لا	2	1	1	لا شيء	يكوا الطيارة والمسلا لا شيء	لا شيء	لا شيء	3	2	2
4	لا	3	3	لا	4	4	4	لا شيء	النظافة	لا شيء	لا شيء	4	2	3
4	نعم	4	4	نعم	3	4	4	العلاج	الهدوء	لا شيء	نعم	4	3	3

# SQL Analysis

For this project, **SQL was used** to query and analyze the cleaned dataset efficiently. SQL enabled fast aggregation, grouping, and filtering, which helped extract meaningful insights from the survey responses.

## Key Queries:

- **Number of patients per service type:** Identified the most frequently used healthcare services.
- **Average satisfaction per service type and age group:** Measured satisfaction trends across services and age groups.
- **Nursing staff performance:** Evaluated attention, respect, and responsiveness.
- **Hospital cleanliness index:** Assessed cleanliness of waiting areas, rooms, corridors, and bathrooms.
- **Best-performing services by cleanliness:** Highlighted top services based on cleanliness scores.
- **Ease of booking, payment, and clarity of explanations:** Measured patient experience for appointments and payments.
- **Food quality and recommendation index:** Evaluated meals and likelihood of recommending the hospital.
- **Department organization and calmness:** Assessed the overall environment and coordination.

## **Questions of the Queries:**

### **Service & Demographic Analysis**

1. What is the total number of visits/records for each specific Service Type?
2. What is the average Overall Satisfaction score for each Service Type?
3. What is the average Overall Satisfaction score when segmented by Age Group?
4. What are the averages for key Nursing Staff Performance metrics (Attention, Respect, and Response Speed) overall?
5. How is Nursing Care Attention rated on average across different recipient Categories?
6. What is the distribution (count) of the Least Satisfactory Aspect of the patient experience?
7. What is the breakdown (count) of records based on Gender?

### **Discharge, Coordination, and Environment**

8. What is the average score for the Ease of Discharge overall?
9. What is the average Ease of Discharge score when grouped by Service Type?
10. What is the average Ease of Discharge score when grouped by the recipient Category?
11. What is the average score for Department Coordination when grouped by Service Type?

12.What is the average Calmness/Quietness score when grouped by Service Type?

13.What is the overall average Calmness/Quietness score?

### **Financial and Recommendation Metrics**

14.What is the overall average score for the Ease of Payment?

15.What is the average Ease of Payment score when grouped by the recipient Category?

16.What is the overall average score for the Clarity of Bills/Invoices?

17.What is the average Clarity of Bills/Invoices score when grouped by the recipient Category?

18.What is the overall average score for Hospital Recommendation to others?

19.What is the average Hospital Recommendation score when grouped by the recipient Category?

### **Food and Hygiene Metrics**

20.What are the overall average scores for the various Hospital Hygiene metrics (Waiting, Rooms, Corridors, Bathrooms)?

21.Which Service Type has the highest composite hygiene index?

22.What is the overall average score for Meal Quality?

23.What is the average Meal Quality score when grouped by Service Type?

24.What is the average Meal Quality score when grouped by the recipient Category?

# Visualization (Power BI)

## Chart Types

- **Scorecards (Cards):** Used for instant visibility of total counts and critical KPIs (e.g., Total Patients).
- **Pie/Donut Charts:** Used to show the proportional distribution of qualitative ratings (e.g., Meal Quality, Ease of Booking).
- **Horizontal Bar Charts:** Used for ranking priorities (e.g., Improvements) and distinct time intervals (e.g., Waiting Time Duration).

## Design Rationale

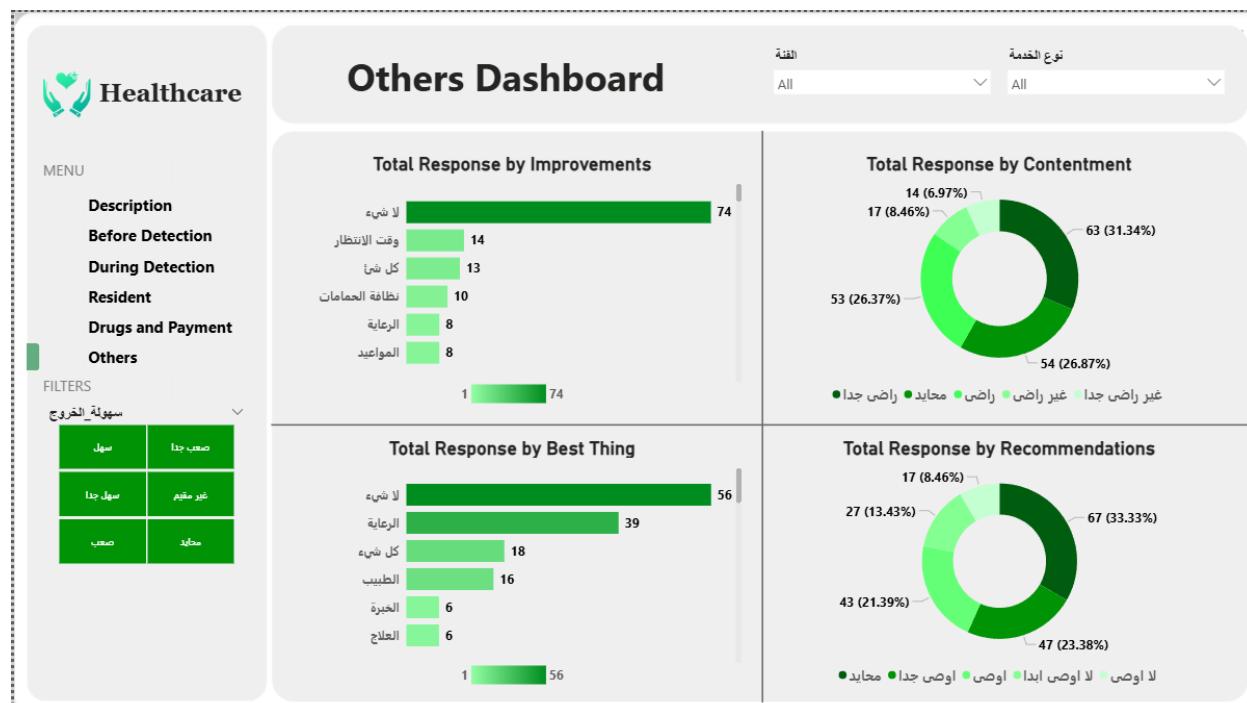
The design prioritizes clarity by separating the patient journey into four distinct functional pillars (Reception, Resident, Drugs & Payment, Others) to allow stakeholders to instantly identify which department needs intervention. The use of simple, color-coded charts ensures quick consumption of complex data.

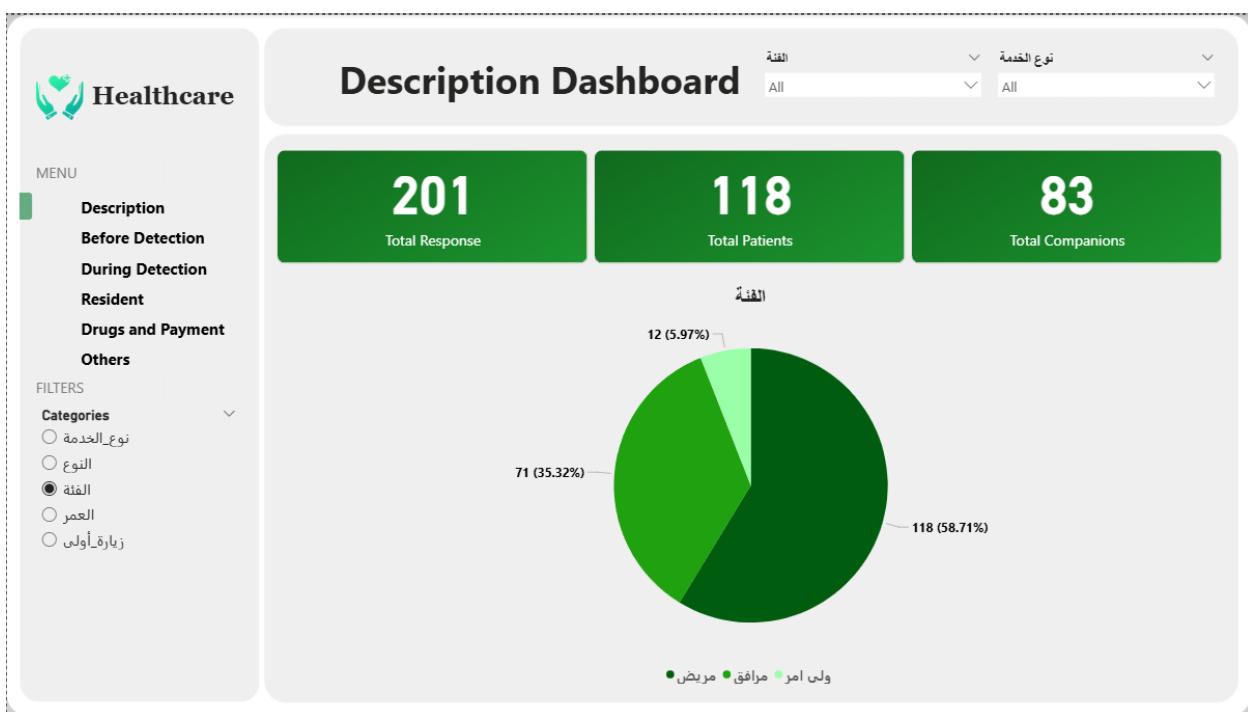
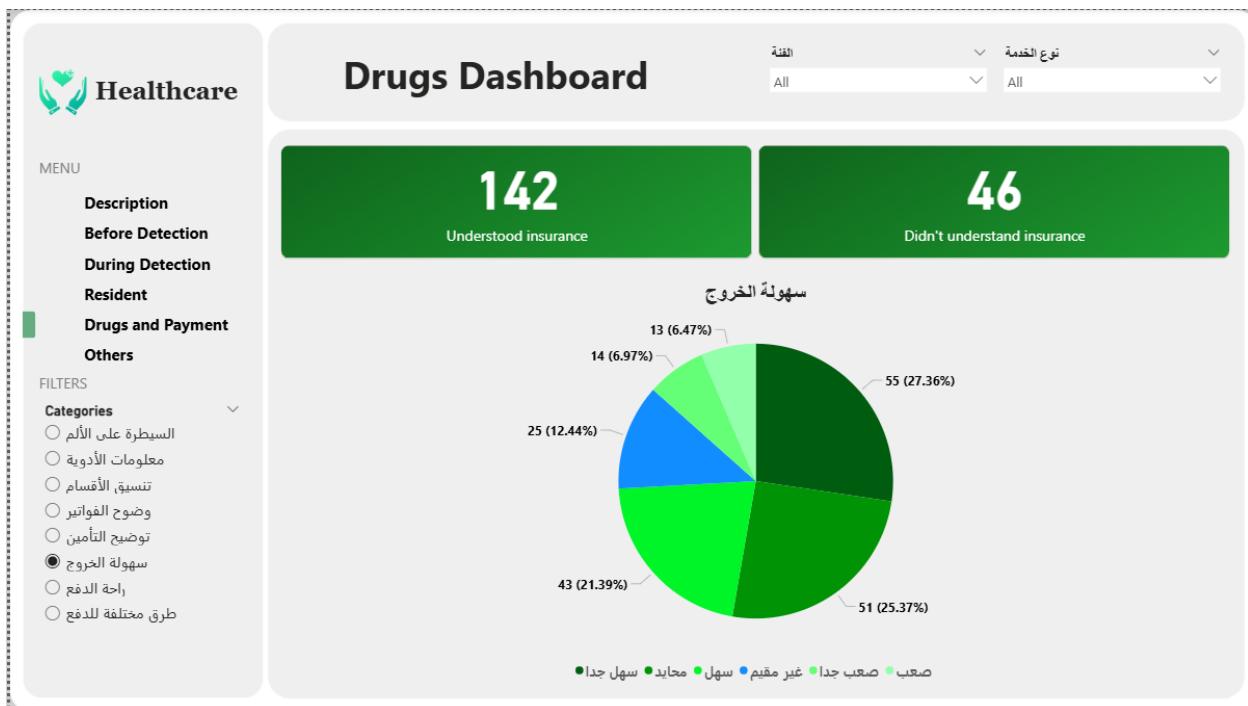
## Key Performance Indicators (KPIs)

The focus was on the patient's end-to-end experience:

- **Operational Efficiency:** Measured by **Waiting Time** and **Process Ease** (Booking/Discharge).
- **Quality of Stay:** Measured by **Meal Quality** and **Privacy Respect**.
- **Communication:** Measured by **Insurance Understanding** and **Information Clarity**.
- **Sentiment:** Measured by **Overall Contentment** and **Recommendation Likelihood**.

## Charts:





# Insights / Findings

## Operational Efficiency and Time Management

- **Critical Waiting Time:** Most of the respondents' reports wait **over 30 minutes** at reception, marking this as the single most critical source of dissatisfaction and inefficiency.
- **Systemic Administrative Friction:** Over **50%** of respondents rate both the **Booking** process and the **Discharge** process as difficult or very difficult, suggesting a flaw in end-to-end administrative workflows.
- **Waiting Time is Priority:** "Waiting Time" is the most requested area for improvement by respondents (excluding "Nothing").

## Quality of Stay and Services

- **Poor Meal Quality:** Approximately **50%** of respondents rate the "Meal Quality" as poor or very poor, which severely impacts the resident patient experience.
- **Strong Privacy Respect:** The facility is highly commended for its commitment to **respecting patient privacy** and dignity, which is a significant strength.
- **Restroom Cleanliness Concern:** "Restroom Cleanliness" is the second most common non-administrative improvement request cited by respondents.

## Communication and Overall Sentiment

- **Conditional Satisfaction:** While overall satisfaction (Satisfied + Very Satisfied) outweighs dissatisfaction, nearly **35%** of respondents are actively dissatisfied or very dissatisfied.
- **The Neutral Gap (NPS):** A significant one-third (approx. **33%**) of respondents are **neutral** regarding recommending the facility, presenting a major opportunity for conversion into promoters.
- **Insurance Clarity is Excellent:** The staff is highly effective in ensuring patients and companions clearly **understand insurance and payment terms.**
- **Core Strength is "Care":** Respondents consistently cite the **quality of care** provided as the best feature of the facility.
- **Information Visibility Issue:** A noticeable number of patients and companions were **unable to clearly see or understand** information presented at reception.

# Recommendations

## Urgent Operational Overhaul (Focus: Waiting Time)

- **Implement a Process Efficiency Team:** Immediately form a cross-functional team (Administration, IT, Operations) dedicated solely to mapping and removing bottlenecks in the patient journey.
- **Target Waiting Time Reduction:** Set a strict KPI to reduce the percentage of patients waiting over 30 minutes by at least 50% within the next quarter.
- **Utilize Technology for Check-in:** Deploy self-check-in kiosks or mobile pre-registration forms to offload administrative tasks from reception staff and reduce queue formation.
- **Dynamic Staffing:** Introduce flexible staffing models at reception to ensure higher personnel coverage during historically busy periods identified by the waiting time data.

## Enhancing Administrative Clarity and Flow

- **Simplify Booking and Discharge:** Redesign the administrative steps required for both check-in and check-out to minimize paperwork and waiting time. Implement a "Discharge Coordinator" role to handle final clearance proactively.
- **Improve Visual Communication:** Update all signage, queue screens, and information boards in the reception area. Use high-contrast designs and larger fonts to immediately address the reported issues with information clarity.
- **Standard Insurance Education:** Provide mandatory refresher training for staff on clarifying insurance terms, ensuring that the 46 respondents who reported not understanding the terms are not repeated.

## **Improving Quality of Stay and Comfort**

- **Immediate Catering Review:** Launch a full audit and review of the catering service and menu, treating the consistently **poor meal quality** ratings as a critical patient safety and comfort issue.
- **Elevate Restroom Standards:** Institute stricter, documented cleaning and maintenance schedules for restrooms, as this is a high-priority cleanliness concern raised by the respondents.

## **Leveraging and Reinforcing Strengths**

- **Reward Clinical Teams:** Formally recognize the staff responsible for the high scores in "**Care**" and "**Respect for Privacy**." Use these teams as benchmarks for training new personnel.
- **Target the Neutral Segment:** Focus outreach and follow-up communication on the large segment of **neutral** recommenders, as they are the most likely group to be converted into promoters once the major pain points (Waiting and Meals) are resolved.

# Conclusion

The primary goal of this project is to highlight the current challenges within the Egyptian healthcare system and to take an initial step towards its improvement through analytical evaluation. The study addresses multiple aspects of the system, including healthcare facilities, patient experiences, and overall organizational structure. By identifying key areas of strength and weakness, this analysis provides a foundation for implementing targeted interventions that can enhance service quality, efficiency, and patient satisfaction.

Ultimately, the aim is to ensure a well-functioning healthcare system that serves the population effectively, guarantees better health outcomes for citizens, and secures a healthier future for the next generations. By improving healthcare, we contribute not only to individual well-being but also to the development of a stronger, happier, and more prosperous society.