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Digital Healthcare Transformation

Scalable End-to-End Solutions

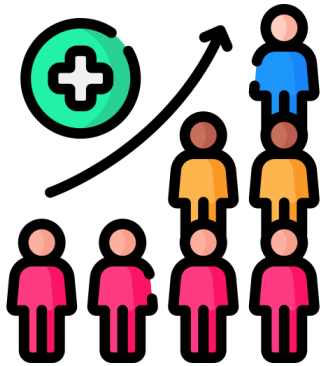
Healthcare Realities

Increased Spending

Ageing population, chronic illnesses, and public healthcare policies increases the amount of spending required to maintain a health population

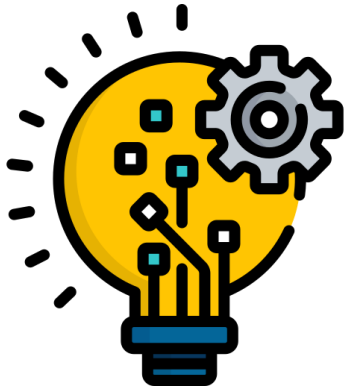
Rising Inequity

Weak governance and weak healthcare systems cause the inequity in access to healthcare services to significantly increase over years



Growing Population

The increase in population is putting more pressure on healthcare providers and authorities and require innovative management strategies due to limited workforce and finance



Paradigm Shift

There is a significant increase in interest, awareness and investment for digital healthcare technologies and projects after the COVID-19 pandemic

Problems

Non-transparent registration processes	**Slow Licensing and Authorization**	**People can not Access Quality health services**
Inadequate Tracking, Monitoring and Evaluation	**High volume of out of pocket expenses**	**Tax Evasion**
Substandard and Falsified Medicines	**Illicit Narcotics Sales**	**Not affordable Prices**

Tackling the Triple Transition in Global Health Procurement | Center for Global Development | Ideas to Action (cgdev.org)

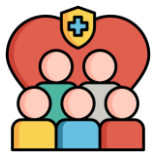
Success Story of Turkey

Fixed Health Expenditure

Turkey's health expenditure to GNP ratio has been fixed at 4-4.5% interval

Reduced Price of Drugs and Devices

Around 40-90% decrease in drug and medical device prices while increasing availability



Increased Public Coverage Ratio

Public payment ratio increased to 90% for drugs and medical devices on market

Universal Health Insurance

Public health insurance coverage reached beyond 99%, effectively covering the entire population

World Health Organization

WHO and OECD Appraisal

WHO has identified the Turkish healthcare reform as a successful reference and a model

Increased Accessibility

Health services accessibility increased from 3.2% to 8.2% after the reform

Superb Patient Satisfaction

Healthcare services patient satisfaction increased from 39.5% to 76%

Increased Efficiency

Physician Outpatient Consultation rate per day increased to 50 consultations from 12

WHO, Successful Health System Reforms: The Case of Turkey

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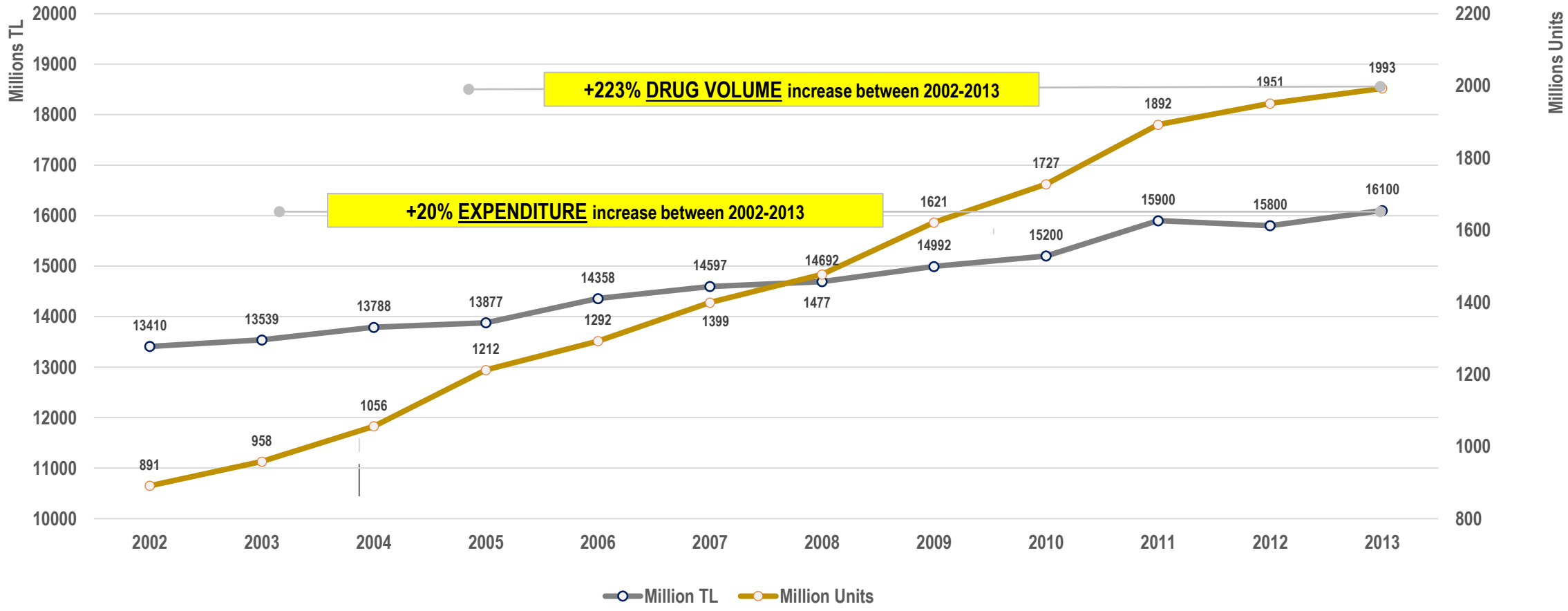
Expenditure/Drug Volume



Source: MoH General Directorate of Health Research Turkish Health Statitstics 2013

Source: MoH General Directorate of Health Services, Researcher Pharma Firms Association Turkish Pharma Report 2014

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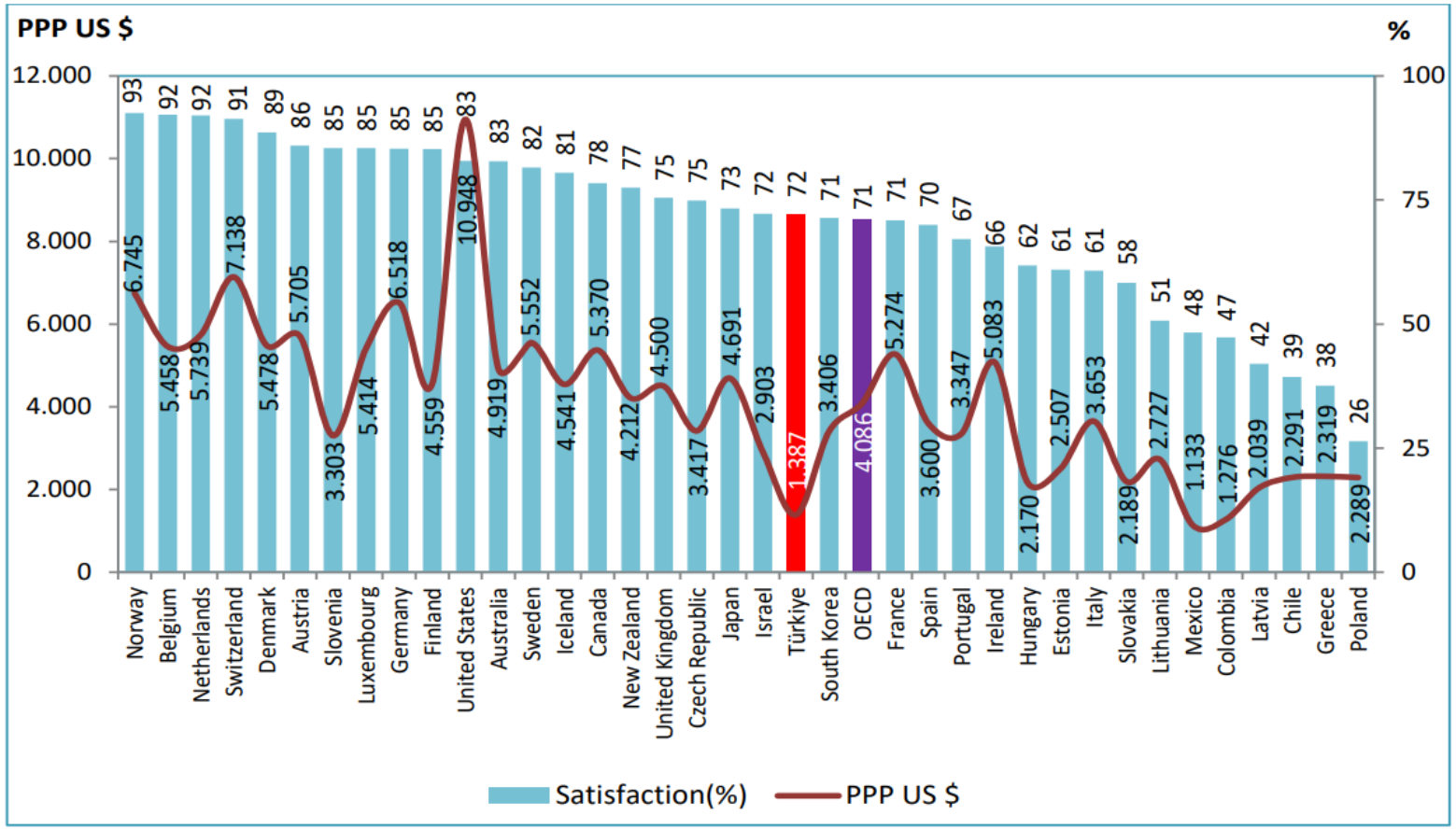
Patient Satisfaction/Expenditure

Figure 8.37. Satisfaction with Health Care Services, (%), 2020 and Total Current Health Expenditure per Capita, (PPP US $), 2019



Source: TURKSTAT, OECD Health Data 2021

1387 USD annual expenditure per capita

72% patient satisfaction

Most efficient health system in OECD

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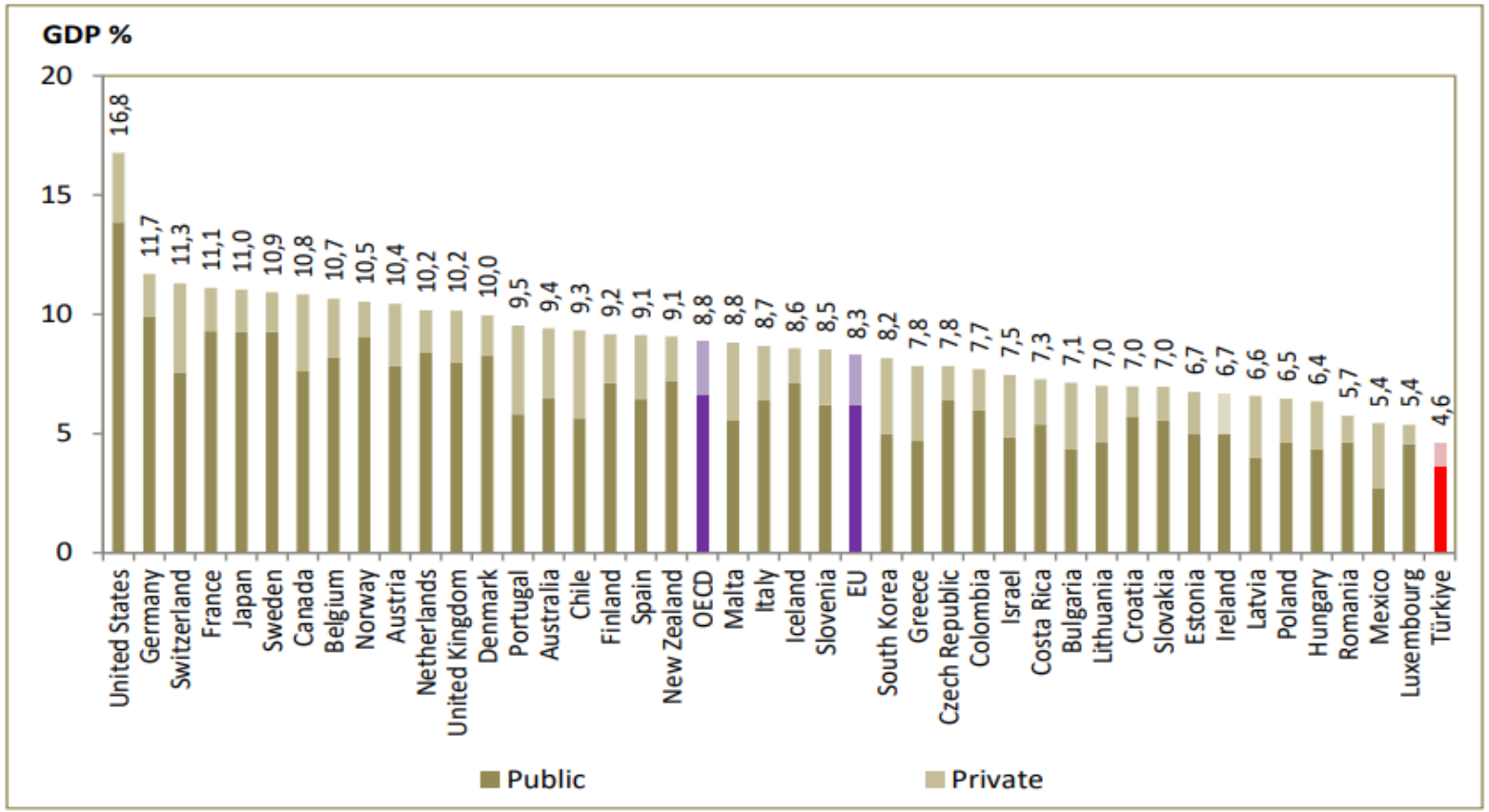
Spending as a share of GDP

Health Expenditure as a share of GDP: <u>4.6%</u>

<u>Lowest</u> in OECD

Figure 11.3. International Comparison of Current Health Expenditure as a Share of GDP, (%), 2019

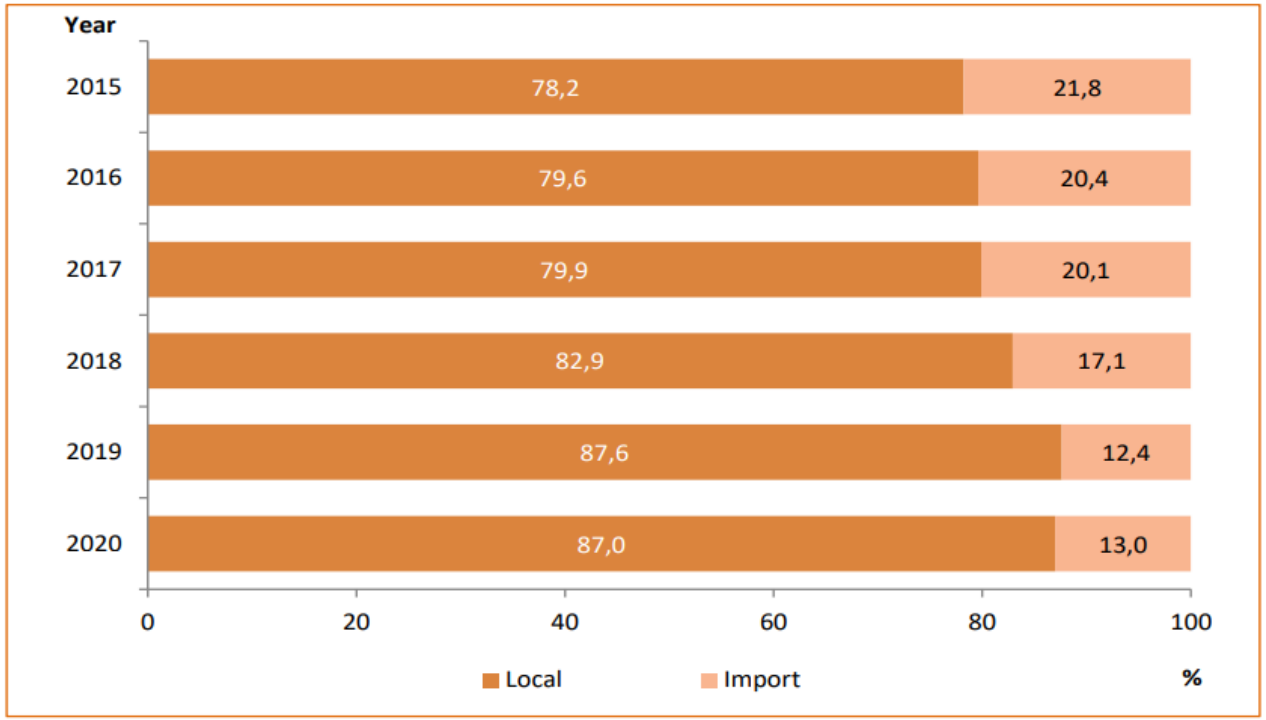


Source: TURKSTAT, OECD Health Data 2021

Note: Türkiye's data belongs to the year 2020. Countries' data belong to the year 2019 or nearest.

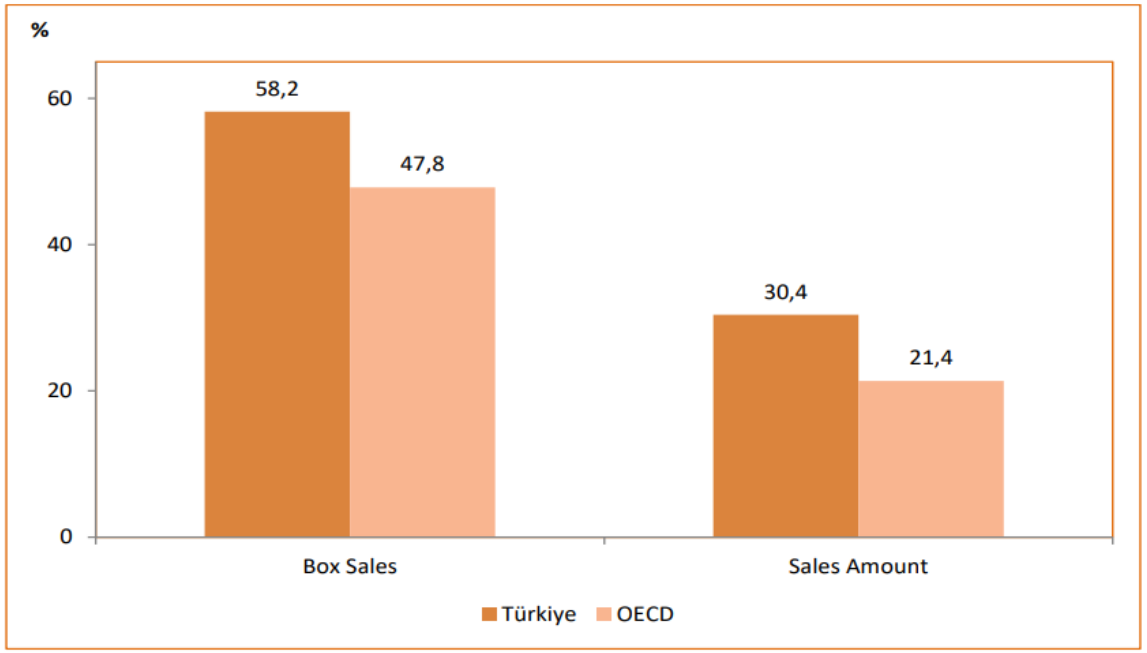
Pharma Sales

Figure 9.14. Distribution of Pharmaceutical Box Sales by Years and Local/Imported Status, (%)



Source: Turkish Medicines and Medical Devices Agency

Figure 9.13. International Comparison of Share of Generic Market with respect to Box Sales and Sales Amounts (National Currency), (%), 2019



Source: Turkish Medicines and Medical Devices Agency, OECD Health Data 2021

Note: Türkiye's data belong to the year 2020. OECD's data belongs to the year 2019 or nearest. Generic drugs include generic and drugs which is not specified original or generic.

Significant opportunity for local pharmaceutical business

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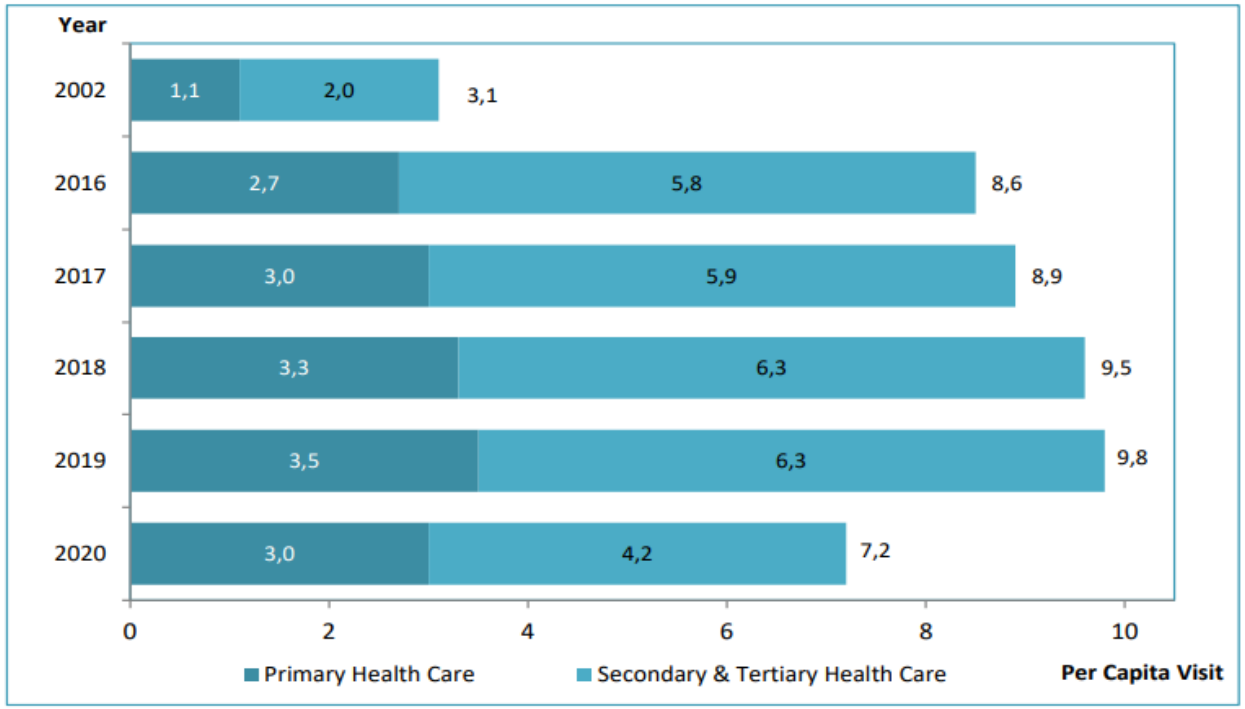
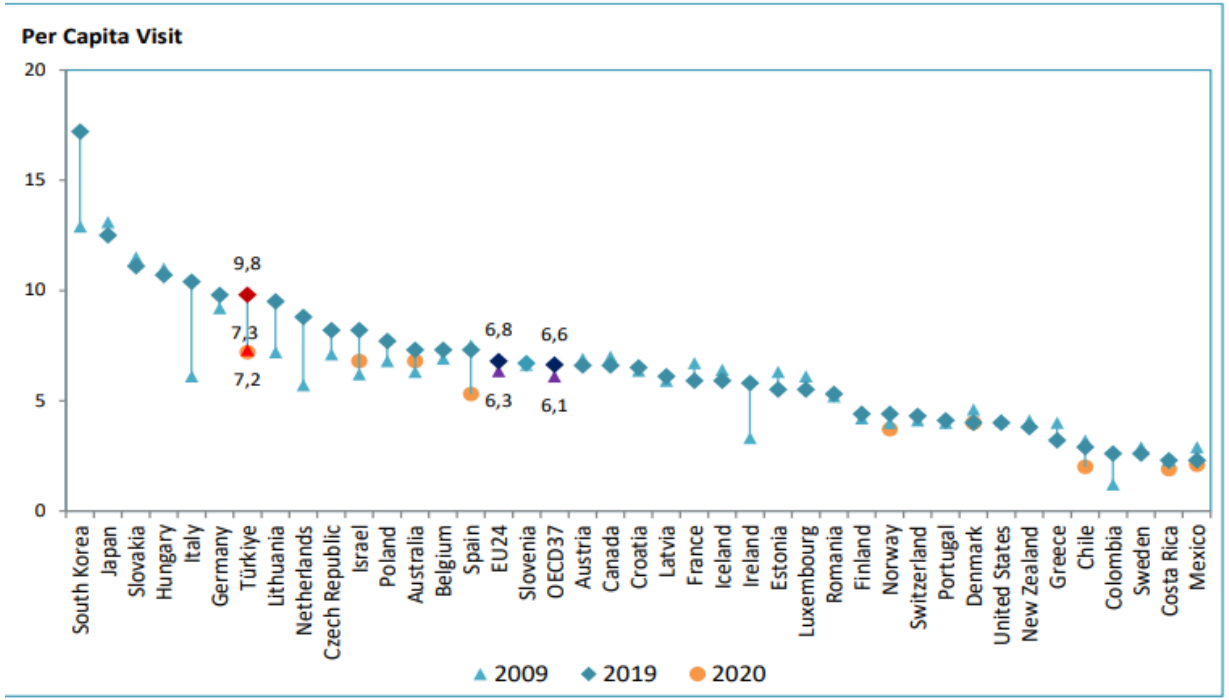
Visits to a Physician

Figure 8.2. Total Number of per Capita Visits to a Physician in Health Care Facilities by Years, All Sectors



Source: General Directorate of Public Health, General Directorate of Health Services

Figure 8.4. International Comparison of per Capita Visits to a Physician, 2009, 2019, 2020



Source: General Directorate of Public Health, General Directorate of Health Services, OECD Health Data 2021, EUROSTAT Database

How did Turkey managed to control the prices and achieve significant success?

- A set of **new regulations** to control the market, prices and public health payments.

- **Integrated information systems** supporting the execution of the new regulations.

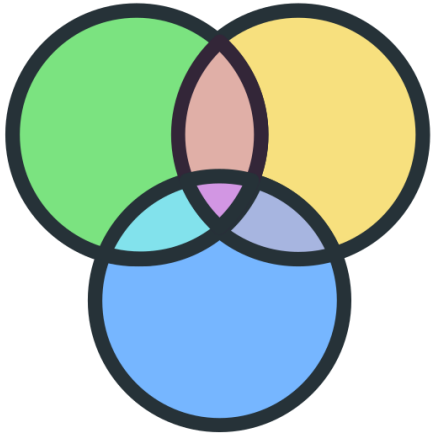
Key Points

Political Determination

Turkey, a developing country without an innovation tradition is the only country in the world that runs a full-cycle Track and Trace System

Stakeholder Alignment

The reform program must engage with all public and private stakeholders to ensure success, the reform is much more than software development



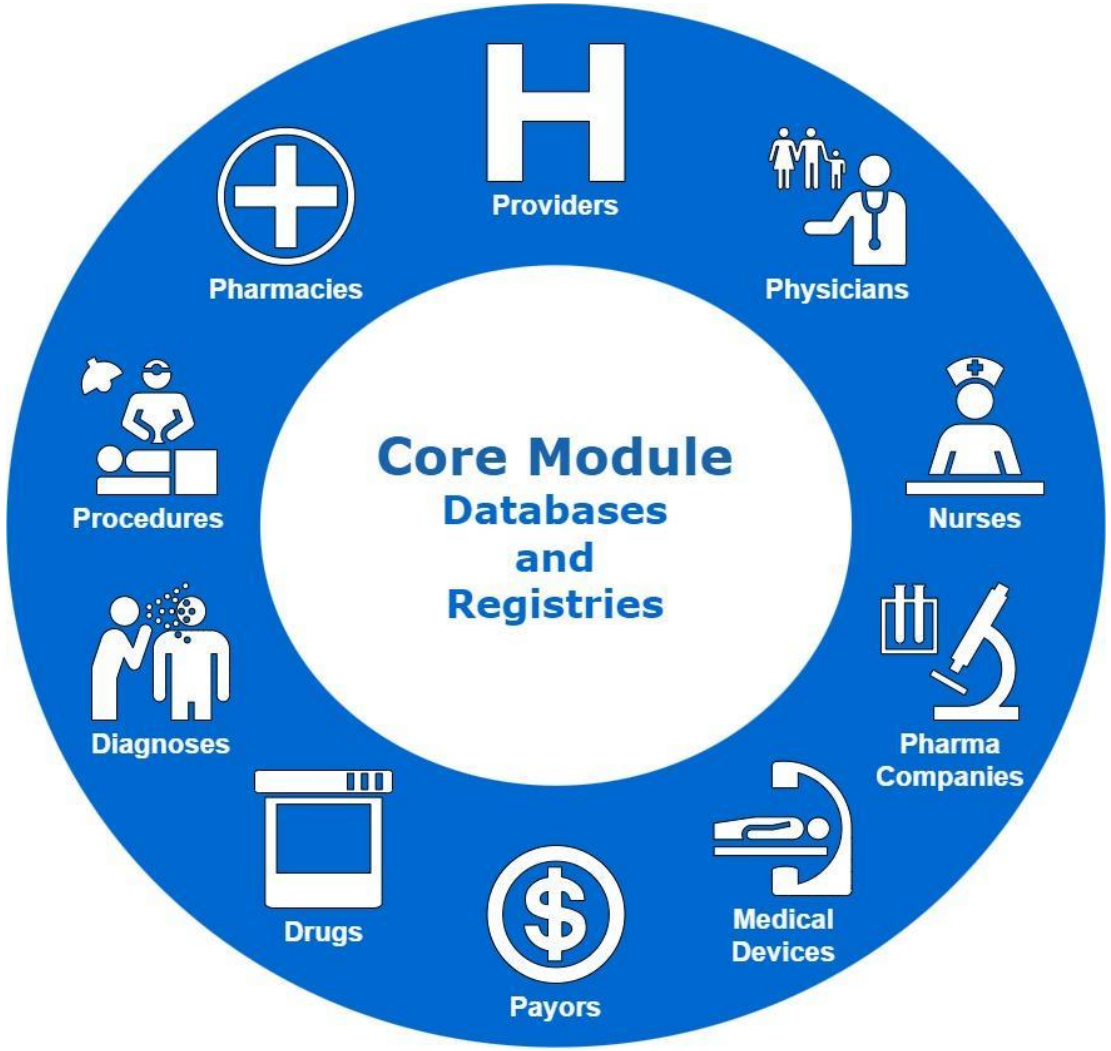
Different Environments

Although basics are the same and based on international standards, every country has a different environment that requires scalability and flexibility

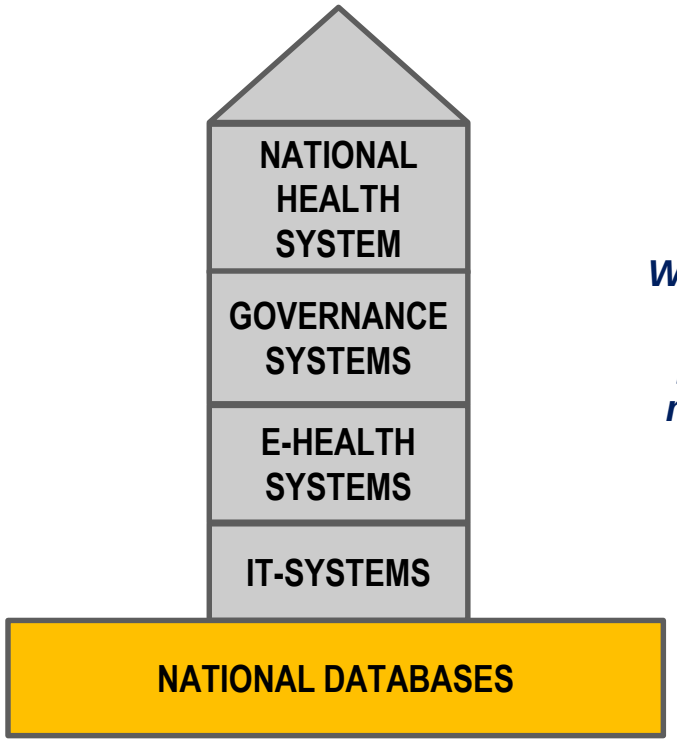
Legislative and Regulatory Support

The system can only work if all necessary regulations and legislations are passed and published as the system only represents one aspect of the health reform program

Proposed Core Module



Core Infrastructure necessary for a functioning healthcare information system



We have ready world-class databases for: drugs, procedures, diagnoses, medical devices, pharma companies

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Extension Modules

E-Health Systems Package

Drug and Device Authority Registration Systems and ERP Module

- Drug Track and Trace
- Device Track and Trace
- E-Procurement
- E-Prescription
- E-Report
- Inventory Manager

Health Insurance Package

MEDIGAP ® Health Insurance Management System

- MEDIRULE ® Smart Rule Engine
- MEDI-DRG ®
- OPUS Terminology Manager®
- Benefits and Network Manager
- Advanced BI and Analytics

Other Modules

- E-Appointment
- E-Referral
- Telehealth

Services

- Strategic Planning
- Inpatient/Outpatient Costing
- Benchmarking

E-Health Systems Package

Registration Systems and ERP

- Fully digitized drug and medical device registration
- e-CTD support
- Dynamic Workflows
- Customizable Interface

Track and Trace

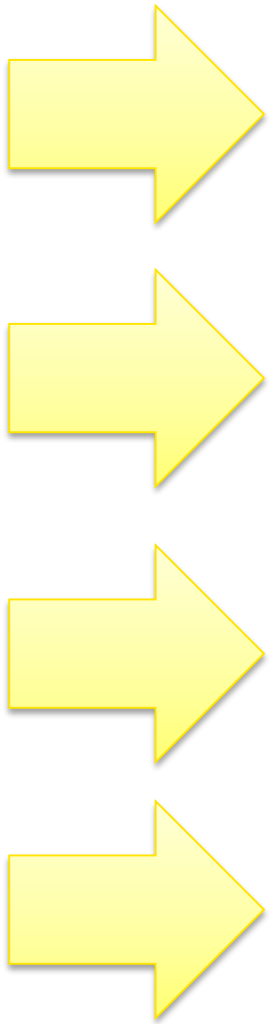
- Supports all data matrix formats
- Customizable supply chain flows
- Centralized Inventory Management
- Full market monitoring for medical products

E-Procurement

- All-in-one platform for all medical purchases
- Supplier Management
- Easy and transparent auditing
- Effective and customizable workflows

E-Prescription

- Remote ordering and refills
- Prescription monitoring and tracking
- Drug and Allergy Interaction Checker
- Medication History



Organized and Encrypted Data

High Quality Insights

Minimal Counterfeit Drugs and Devices

Cost Savings

Full Supply Chain Control

Improved Patient Outcomes

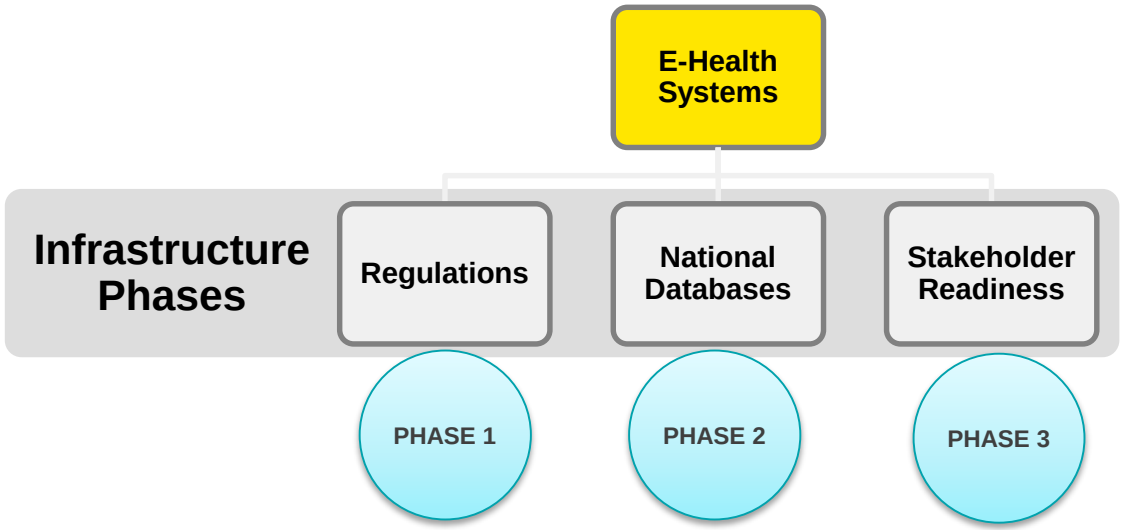
Reduced Tax Evasion

Efficient Workflows

Cross Department Collaborations

Central Inventory Management

Infrastructure Phases



e-Procurement | e-Registration | e-Prescription | Inventory Management | Track and Trace | Claim Management

E-Health System Phase

Stakeholder IT Readiness

PHASE 3

Healthcare providers and other key stakeholders must have appropriate IT infrastructure in order to connect to the national e-health systems.*(**parallel process to PHASE 2 and 3)*

Regulatory and Legal Framework

PHASE 1

A set of new regulations must be published to regulate and guide the market in order to ensure market readiness and awareness for Phase 2 and 3 *(**parallel process to PHASE 2 and 3)***

National Healthcare Databases

PHASE 2

National and centralized databases and registries must be built to record information regarding healthcare services.
(parallel process to PHASE 2 and 3)

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Phase 1

PHASE 1

Preparation and Publishment of New Regulations for the healthcare market

A set of new regulations must be published to regulate and guide the market in order to ensure market readiness and awareness for Phase 2 and 3

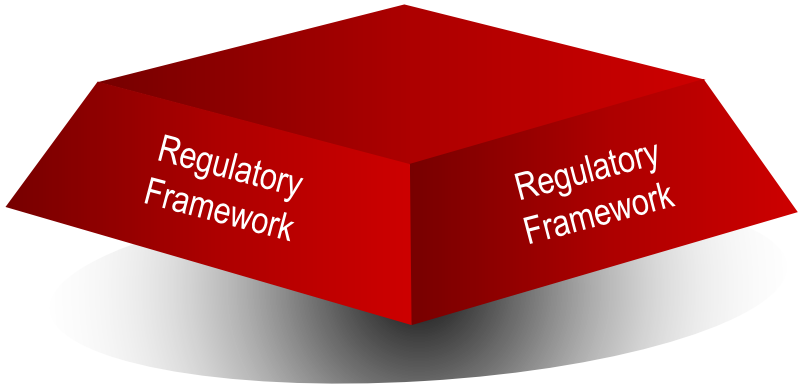
Regulations for the E-Health Transformation Program:

- Healthcare stakeholder e-Registration
- e-Submission processes
- Drug & Medical Device licensing processes
- Products and Services registrations

Planning

- A Change Management Plan
- A Project Plan
- An Implementation Plan including:

- Education and Training
- End user Support



Regulations must be compatible to international norms and standards in order to maintain international interoperability, sustainability and reliability.

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Phase 2.1

PHASE 2

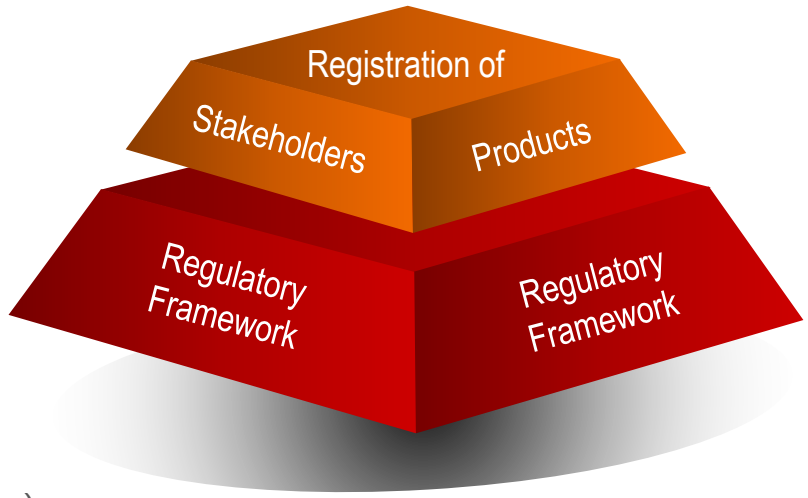
National Healthcare Databases

National and centralized databases and registries must be built to record information regarding healthcare services.

PHASE 2.1

Central Electronic Registries for the Healthcare Ecosystem

- Therapeutic Goods (Drug and Medical Device) Manufacturing Plants
- Therapeutic Goods Manufacturers and Importers
- Therapeutic Goods Distributors, Wholesalers and Warehouses
- Pharmacies and Medical Device Retailers
- Public Healthcare Providers (Hospitals, Clinics etc.)
- Private Healthcare Providers
- Physicians
- Registered and Practitioner Nurses
- Payors and Insurers (if available)



All stakeholder registration processes must be electronic, (e-application, e-submission, e-licencing) compatible with international norms and standards in order to maintain international interoperability, sustainability and reliability. National e-Health Databases must be integrated with other governmental agencies like Taxation Authority, Customs Protection Authority and other relevant agencies

Phase 2.2

PHASE 2

National Healthcare Databases

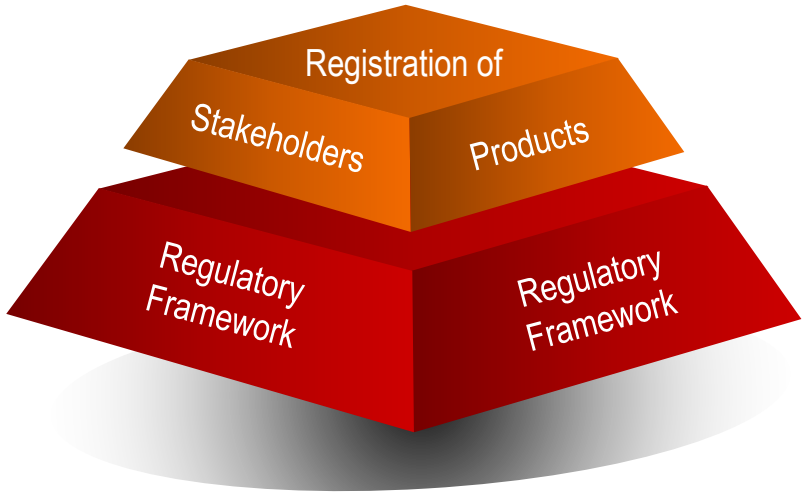
National and centralized databases and registries must be built to record information regarding healthcare services.

PHASE 2.2

e-Registration Systems for the Therapeutic Goods

- e-Registration of Pharmaceuticals using e-CTD:
  - Medicines
  - Vaccines and Blood Products
  - Controlled Substances (Narcotics, Psychotropic Drugs)
  - Birth Control (Condoms, pills, injections etc.)
  - Nutritional Supplements
  - Herbal Supplements

- e-Registration of Medical Devices:
  - Class I
  - Class II
  - Class III
  - IVD



All product registration processes must be electronic (e-application, e-submission, e-licencing) and compatible to international norms and standards in order to maintain international interoperability, sustainability and reliability.

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Phase 3

PHASE 3

Stakeholder IT Readiness

Healthcare providers and other key stakeholders must have appropriate IT infrastructure in order to connect to the national e-health systems.

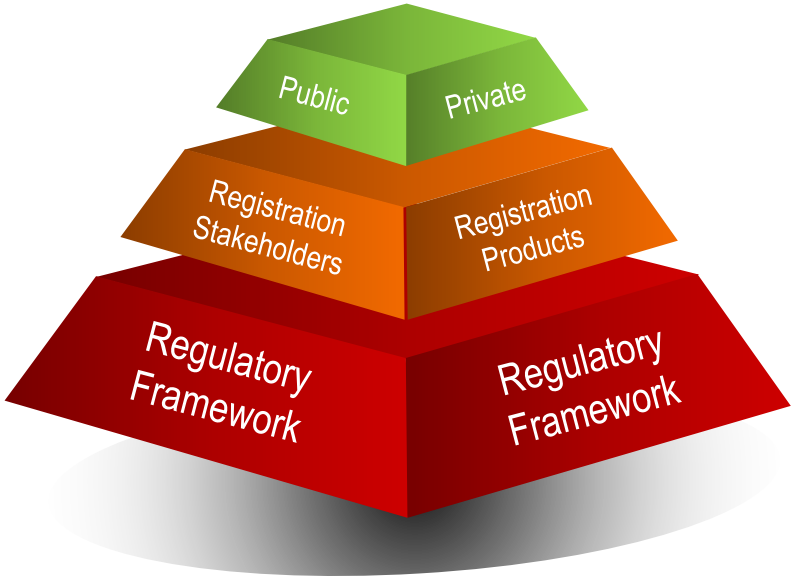
Software Integration

- Therapeutic Goods Manufacturers and Importers
- Therapeutic Goods Distributors, Wholesalers and Warehouses
- Pharmacies and Medical Device Retailers
- Public Healthcare Providers (Hospitals, Clinics etc.)
- Private Healthcare Providers

must have the infrastructure that can be integrated through APIs or must use the web portal

T&T Labelling

- Manufacturing plants or importers must have the necessary infrastructure or arrangements for printing and labelling goods with a GS1 compliant data matrix (our system is compatible with all standard formats)



Hardware and software provided by the stakeholders should be integrated to the national system without hindrance. Stakeholders may require investment and time for the adaptation process therefore this phase must be completed before the activation of national e-health systems.

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E-Health Systems Phase

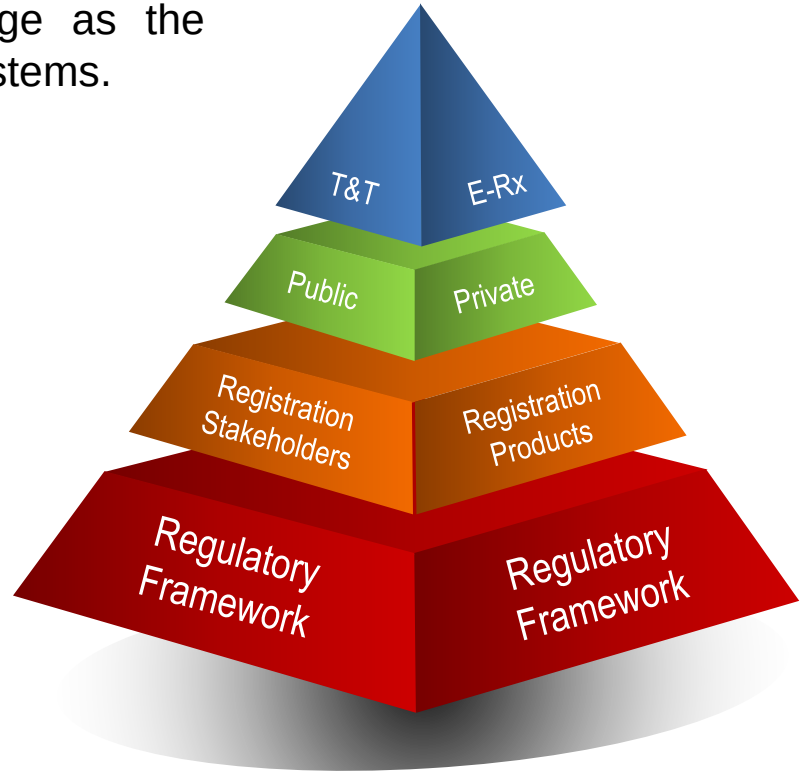
E-Health

National e-Health Systems

All e-health systems can be implemented after the infrastructure stage as the centralized databases will form the backbone of all electronic healthcare systems.

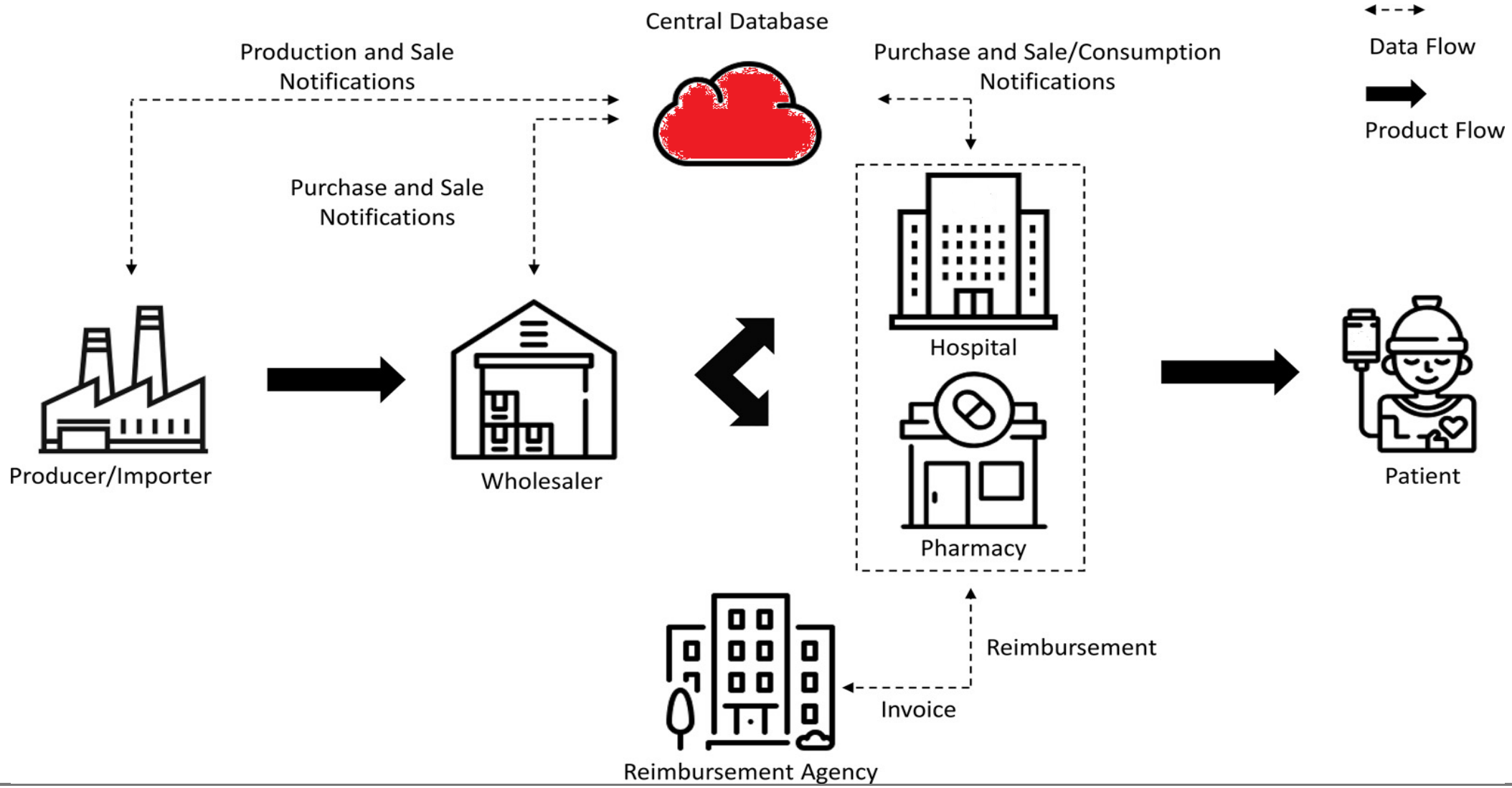
E-Health Systems:

- e-Procurement
- Drug Track & Trace
- Medical Device Track & Trace
- e-Prescription
- e-Appointment
- e-Referral
- Centralized Inventory Management System
- Electronic Claim Management
- National Patient Health Records



All national e-health systems must be integrated to the Central National Database for real-time data retrieval and transmission.

T&T Concept



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Data Matrix Example

(01)08691234567890
(21)111323424679
(17)100331
(10)X2512061322

GTIN + SN = unique identifier

(01) GTIN
Global Trade Item Number
(barcode)

(21) SN
Serial Number

(17) XD
Expiration Date

(10) BN
Batch Number

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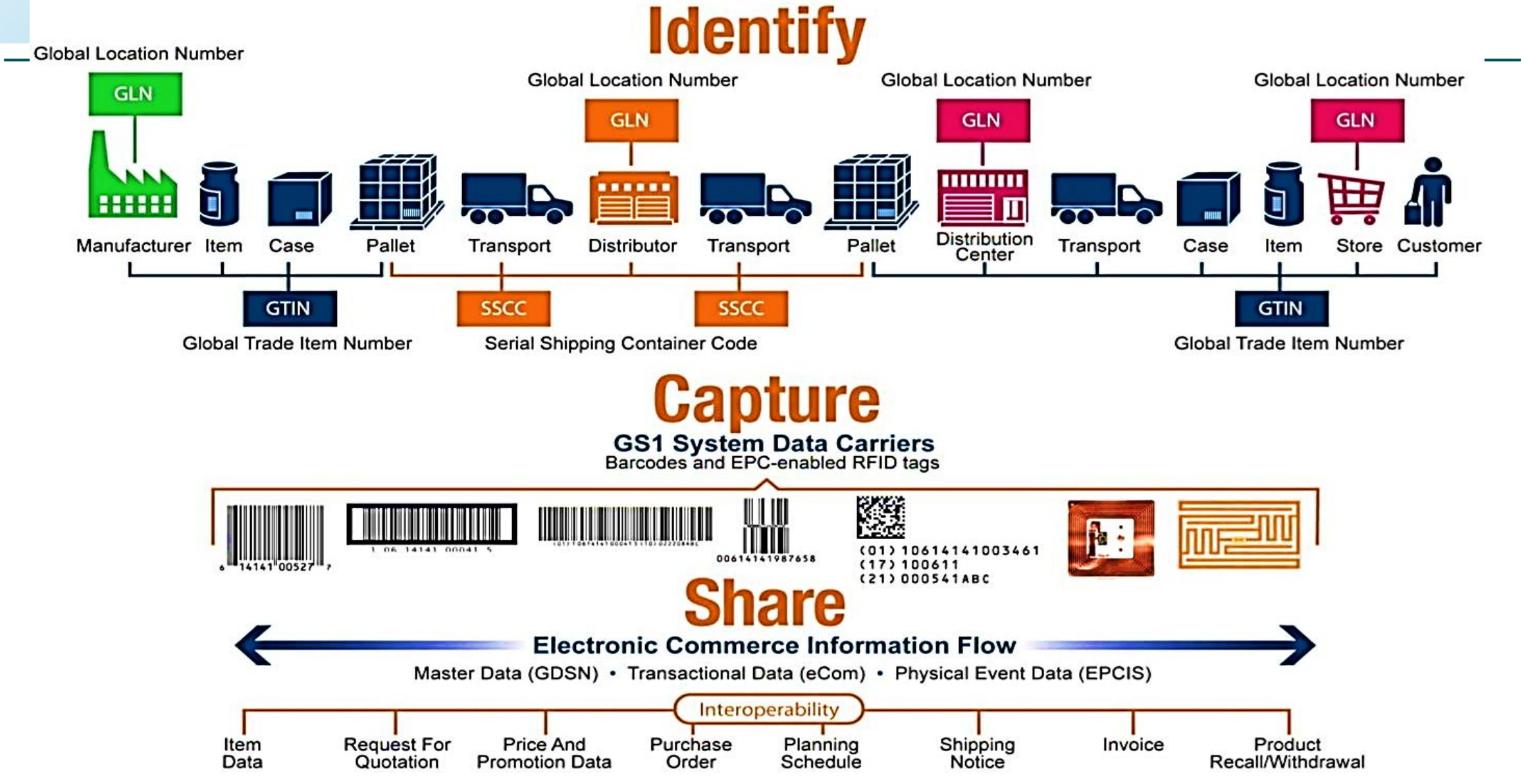
Identify
Global Location Number
GLN
Manufacturer
Item
Case
Pallet
GTIN
Global Trade Item Number
Global Location Number
GLN
Transport
Distributor
Transport
SSCC
SSCC
Serial Shipping Container Code
Pallet
Global Location Number
GLN
Distribution Center
Transport
Case
Item
GTIN
Global Trade Item Number
Global Location Number
GLN
Store
Customer
Capture
GS1 System Data Carriers
Barcodes and EPC-enabled RFID tags
(01) 10614141003461
(17) 100611
(21) 000541ABC
Share
Electronic Commerce Information Flow
Master Data (GDSN) • Transactional Data (eCom) • Physical Event Data (EPCIS)
Interoperability
Item Data
Request For Quotation
Price And Promotion Data
Purchase Order
Planning Schedule
Shipping Notice
Invoice
Product Recall/Withdrawal