Purpose and methodology

- *Purpose*: develop a relevant, operational and comprehensive system of indicators for M&E regional health services masterplans - NHS 2030, including data collection and reporting tools, in order to support evidence-based health policies, decisions, planning resources and health interventions in Romanian healthcare system, also regional development, for the next 7 years.

Methods:

- Literature review – selecting suitable M&E indicators for implementation of RMHS; general framework for assessment used by Eurostat, OECD, WHO, EHCI.
- Critical appraisal of indicators currently used in Romania for health services evaluation and reimbursement.
- Develop complete dataset of M&E indicators for health services, structured per levels of care, including: type, definition, intervention area, formula, unit of measurement, necessary data, data sources, links with other indicators, target value.
- Retrospective data analysis of indicators already in use for health services in Romania 2019-2023, comparative analysis, simulations, estimate deficits and trends for the critical ones.
- Data levels: healthcare provider, county, region, national
- Data sources: NI Statistics, MoH, NHIF, NIHSM – DRG, NIPH.

Context

- No national unitary healthcare dataset collected and analyzed
- **National Health Strategy 2030** - *Together for health* (**NHS**), approved by Government decision no.1004/2023
- NHS 2030 to be implemented through **8 regional masterplans**
- Masterplans - developed within the European Project 728 "*Creating the strategic and operational framework for planning and reorganizing the health services at regional and national level*" (ACOP)
- Masterplans – based on healthcare needs assessment, using all available data and relevant comparators
- Targeting public health problems and specific issues on each region
- Need for a complex **set of M&E indicators of masterplan interventions** direct related to NHS objectives

NHS general objectives	NHS specific objectives
1. Public health	
OG.**1. ENSURING PH SYSTEM SUSTAINABILITY AND RESILIENCE**	• OS.1.1. Increase institutional capacity and societal role of PH system • OS.1.2. Integrated approach of social determinants of health and strengthening the programmatic capacity for major PH interventions • OS.1.3. Strengthen surveillance capacity, and rapid, pertinent & coordinated response to PH threats • OS.1.4. Develop PH community capacity to decrease health inequities • OS.1.5. Improve performance of national system for blood transfusion safety
OG.**2. INCREASING THE NUMBER OF HEALTHY LIFE YEARS AND QUALITY OF LIFE**	• OS.2.1. Develop capacity and increase competence in health education & health promotion • OS.2.2. Consolidate prevention through health risk assessment, screening and early diagnosis, prevent diseases and control their progression across life time • OS.2.3. Improve the capacity of response to challenges generated by demographic changes and epidemiologic health trends, over lifetime
OG.**3. REDUCING MORTALITY & MORBIDITY OF COMMUNICABLE DISEASES**	• OS.3.1. Reduce the burden of preventable diseases through vaccination • OS.3.2. Proper control of antibiotics resistance and nosocomial infections • OS.3.3. Reduce burden of primary communicable diseases

General objectives	Specific objectives
2. Health care services OG.**4.** **IMPROVE AVAILABILITY, AND EQUITABLE AND TIMELY ACCESS TO SAFE, COST-EFFECTIVE HEALTH SERVICES & HEALTH TECHNOLOGIES**	• OS.4.1. Professionalizing the health services integrated at local community level • OS.4.2. Redefine the role and improve performance primary medical care • OS.4.3. Increase performance and efficiency of ambulatory diagnostic, treatment and monitoring capacity • OS.4.4. Proper sizing, consolidation, coordination and development of hospital acute care, in order to improve access, quality and performance services offered to the patients at local, regional and national level • OS.4.5. Improve, professionalize and diversify post-acute healthcare facilities • OS.4.6. Improve, professionalize and diversify long term healthcare facilities (long term home care, day care and long term institutionalized care) • OS.4.7. Increase performance and efficiency of emergency medical care system • OS.4.8. Optimize the provision of health services targeting major PH problems • OS.4.9. Improve proper access to safe and cost-effective health technologies • OS.4.10. Appropriate medicine coverage, predictable and financially sustainable for patients, public budgets, providers and suppliers

General objectives	Specific objectives
3. An intelligent & equitable health system OG.**5. HEALTH SYSTEM GOVERNANCE**	• OS.5.1. Increase governance capacity of the health system authorities • OS.5.2. Increase and professionalize the capacity for health policy planning and implementing • OS.5.3. Develop and implement planning and prioritizing tools for services and PH interventions • OS.5.4. Monitor health system performance
OG.**6. HEALTH SYSTEM FINANCIAL SUSTAINABILITY AND RESILIENCE**	• OS.6.1. Increase revenues and diversify health financing sources, ensuring financial protection of vulnerable groups • OS.6.2. Increase efficiency public financing sources for health services • OS.6.3. Universal access to health services financed from public funds • OS.6.4. Prioritize and efficiently allocate the healthcare budget • OS.6.5. Develop strategic contracting mechanisms for health services • OS.6.6. Innovative payment mechanisms for health services & health professionals • OS.6.7. Increase efficiency of medical services financing

OG.**7. ENSURING APPROPRIATE HUMAN RESOURCES, THEIR RETENTION AND PROFESSIONALIZATION**	OS.7.1. Elaborate an integrated public policy for HR in the health system OS.7.2. Ensure HR training & development according to health system needs OS.7.3. Improve the HRM within the health system, to increase performance of health professionals
OG.**8. INCREASING HEALTHCARE SYSTEM FAIRNESS, TRANSPARENCY AND ACCOUNTABILITY**	OS.8.1. Restructure information management system of the health system through modernization, increasing their robustness, digitalization and interoperability OS.8.2. Develop and implement standards for health services delivery and PH interventions OS.8.3. Increase the monitoring, auditing and feedback capacity of health services and PH interventions
OG.**9. HEALTH SERVICES COORDINATION AND INTEGRATION**	OS.9.1. Healthcare needs assessment and planning the health services at national, regional and local level OS.9.2. Develop and implement territorial health services networks for the major PH problems
OG.**10. APPROPRIATE INTEGRATION OF RESEARCH &INNOVATION TO IMPROVE HEALTH STATUS**	OS.10.1. Increasing institutional capacity for fundamental and applied scientific research in health
OG.**11. IMPROVING THE QUALITY OF HEALTH SERVICES BY INVESTING IN HEALTH INFRASTRUCTURE**	OS.11.1. Increase the administrative capacity for planning, financing, preparing and implementing investments in public infrastructure for health OS.11.2. Increasing the access and quality of medical services by continuing

Results

- Comprehensive, complex set of M&E indicators (*resources, process, outcome & impact*) designed for all the 8 regional Masterplans
- 148 indicators considered, defined, studied, of which **115 selected & analyzed** (*in use* and *progress*) :
  - 14 for primary healthcare indicators
  - 7 for dental care
  - 3 for pharmacy
  - 9 for clinical + 4 paraclinical ambulatory
  - 8 for ambulance emergency care
  - 7 for hospital daycare
  - 17 for hospital acute care admissions + 9 chronic care admissions
  - 37 for hospital infrastructure & equipment
- Database 2019 &2022, model for data collection

M&E set of indicators selected

| Level of care	Code	Indicator
Primary care - Family medicine	**APMF-01**	Number of **family physicians** per 100,000 inhabitants (total/urban/rural)
	APMF-02	Number of family physicians in contract with HIF per 100,000 inhabitants (T/U/R)
	APMF-03	Number of **FP nurses** per 100,000 inhabitants (T/U/R)
	APMF-04	Total number of FP medical offices/ 100,000 inhabitants (T/U/R)
	APMF-05	Number of **localities without FP** / county/ region
	APMF-06	**Deficit/surplus of family physicians** according to current normative (T/U/R)
	APMF-07	% patients visiting their FP, of total persons registered at FP during reporting period
	APMF-08	Average **number of FP consultations** provided to patients registered on their list (T/U/R)
	APMF-09	Number of **FP consultations** per 100,000 inhabitants (T/U/R)
	APMF-10	Number additional diagnostic and therapeutic services provided by FP per 100,000 inhabitants (T/U/R)
	APMF-11	Number of FP **preventive** medical services per 100,000 inhabitants (T/U/R)
	APMF-12	Number of FP **curative** medical services per 100,000 inhabitants (T/U/R)

Level of care	Code	M&E Indicator
Dentistry	APMD-01	Number of **dentists** per 100,000 inhabitants (T/U/R)
	APMD-02	**% dentists in contract with HIF** of total dentists
	APMD-03	Total number of **dental offices/clinics** per 100,000 inhabitants (T/U/R)
	APMD-04	Total number of dental offices in contract cu HIF of total dental offices/clinics (T/U/R)
	APMD-05	**% public dental offices** in total dental offices/clinics (T/U/R)
	APMD-06	Average number of **dental consultations & treatments reimbursed by HIF** per 100,000 inhabitants
	APMD-07	**Deficit/surplus of dentists** according to current normative (T/U/R)
Pharmaceutical services	APSF-01	Average number of **pharmacists** per 100,000 inhabitants
	APSF-02	Number of **pharmacies** per 100,000 inhabitants (T/U/R)
	APSF-03	**% rural pharmacies** in total

Medical personnel/100,000 inhabitants, regions, 2022

Legend: physicians, family doctors, dentists, pharmacists, nurses

Region	physicians	family doctors	dentists	pharmacists	nurses
B-IF	794	101	216	227	1194
Center	365	67	116	137	864
NE	291	49	81	107	767
NW	375	64	131	1…	860
S	170	49	57	61	671
SE	248	55	89	101	778
SW	347	70	92	101	906
W	525	87	149	112	898
National	374	65	112	119	854
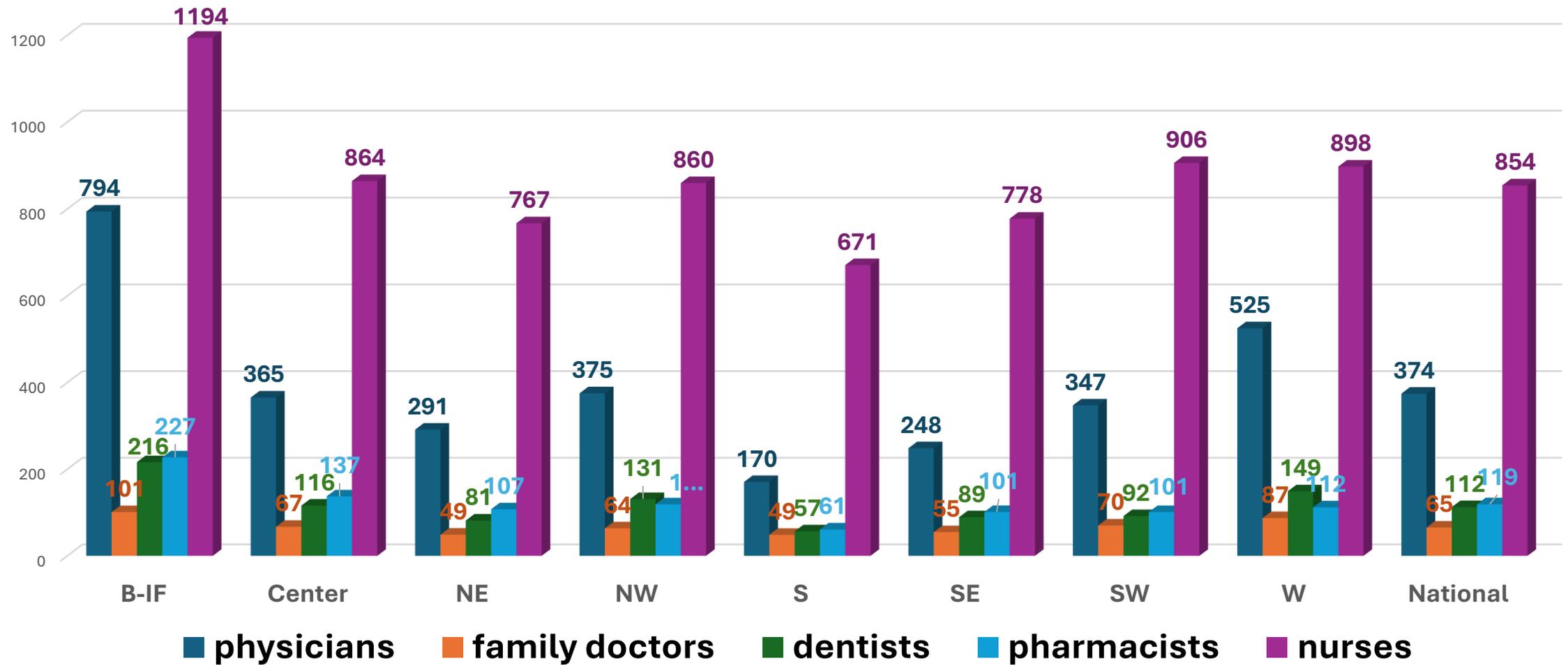
Family doctors DEFICITS, 2022

FP rural deficit / FP urban deficit

Region	FP rural deficit	FP urban deficit
BIF	36	73
CE	125	46
NE	88	193
NW	108	42
South	181	77
SE	212	166
SW	77	11
W	100	39
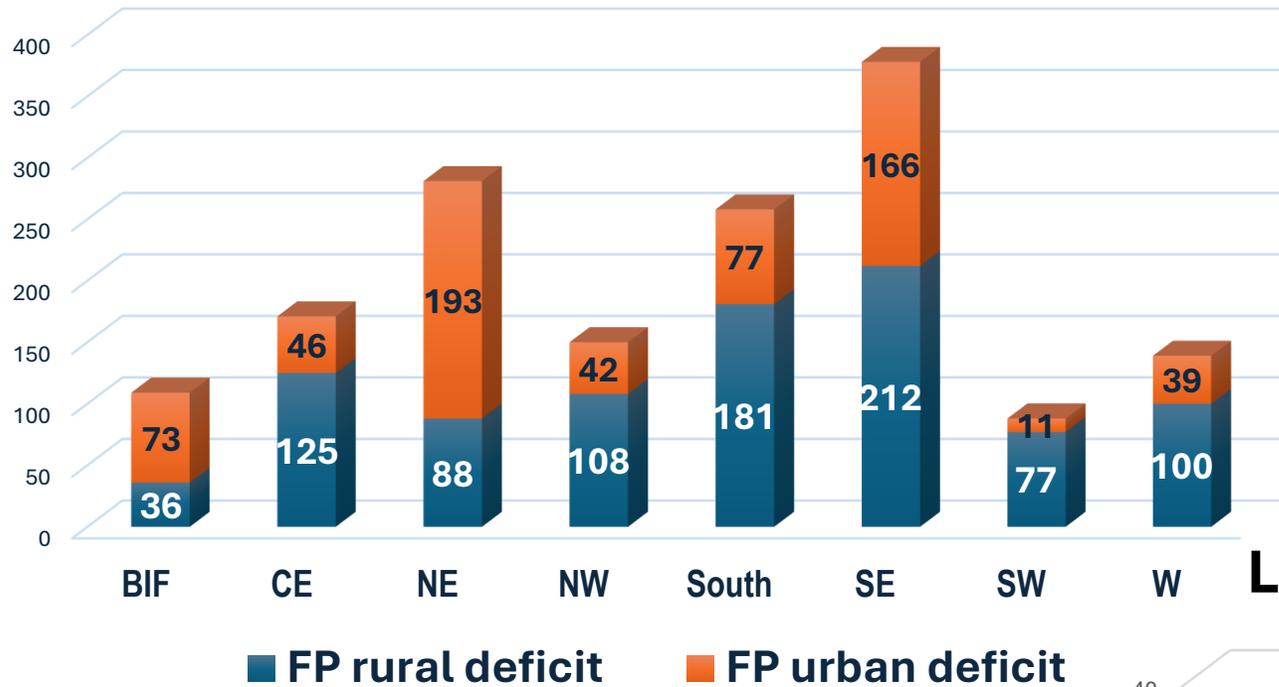
Deficit of 1574 family doctors in total

182 localities without family doctor

Localities without family doctor, 2022

Region	Localities without family doctor
BIF	0
Center	31
NE	23
NW	22
S	25
SE	34
SW	11
W	36
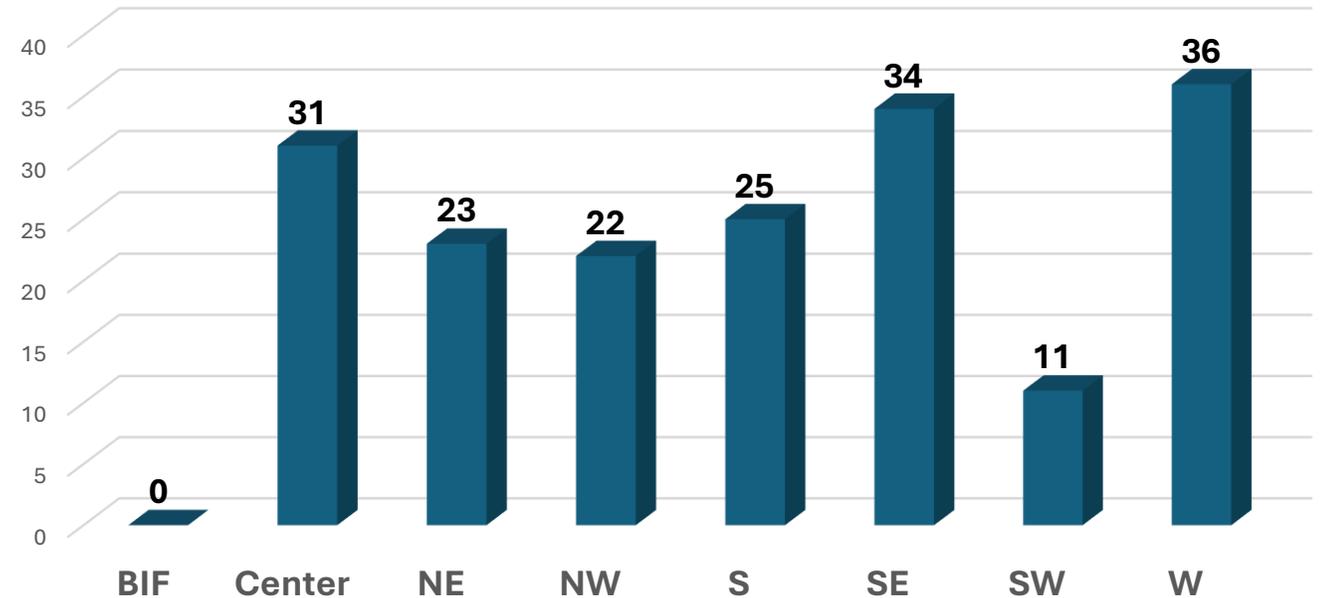
Level of care	Code	M&E Indicator
Clinical ambulatory	**AMBC-01**	Number of ambulatory **providers** per 100,000 inhabitants
	AMBC-02	Number of ambulatory providers in contract with HIF per 100,000 inhabitants
	AMBC-03	Number of **physicians** in each specialty in contract with HIF (hospital/ambulatory/hospital &ambulatory) per 100,000 inhabitants
	AMBC-04	Number of physicians norms contracted in clinical ambulatory per 100,000 inhabitants
	AMBC-05	Number of **ambulatory clinical services** contracted per 100,000 de inhabitants
	AMBC-06	Number of ambulatory clinical services for *cardiovascular diseases* per 100,000 inhab.
	AMBC-07	Number of ambulatory clinical services for *diabetes mellitus* per 100,000 inhabitants
	AMBC-08	Number of ambulatory *oncological* services per 100,000 inhabitants
	AMBC-09	**Deficit/surplus of specialist physicians** (all specialties) in ambulatory in contract with HIF, according to current normative
Paraclinical ambulatory	**AMBP-01**	Number of paraclinical service providers per 100,000 inhabitants
	AMBP-02	Number of paraclinical service providers in contract with HIF per 100,000 inhabitants
	AMBP-03	Number of physician norms contracted in paraclinical ambulatory per 100,000 inhab.
	AMBP-04	Number of paraclinical services contracted in ambulatory per 100,000 inhabitants,

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MD DEFICITs in ambulatory per county, basic specialties, estimated by 2030

reference: 1 MD/10.000 inhab.

Internal medicine
121
5

Gen. surgery
186
4

Pediatrics
179
20

Ob-Gyn
97
16

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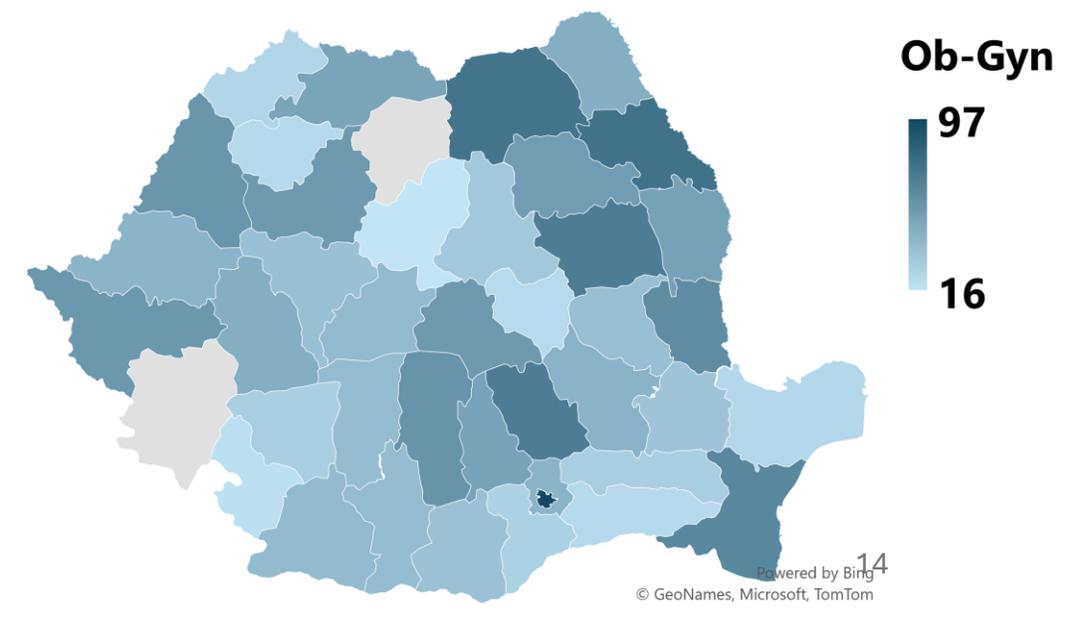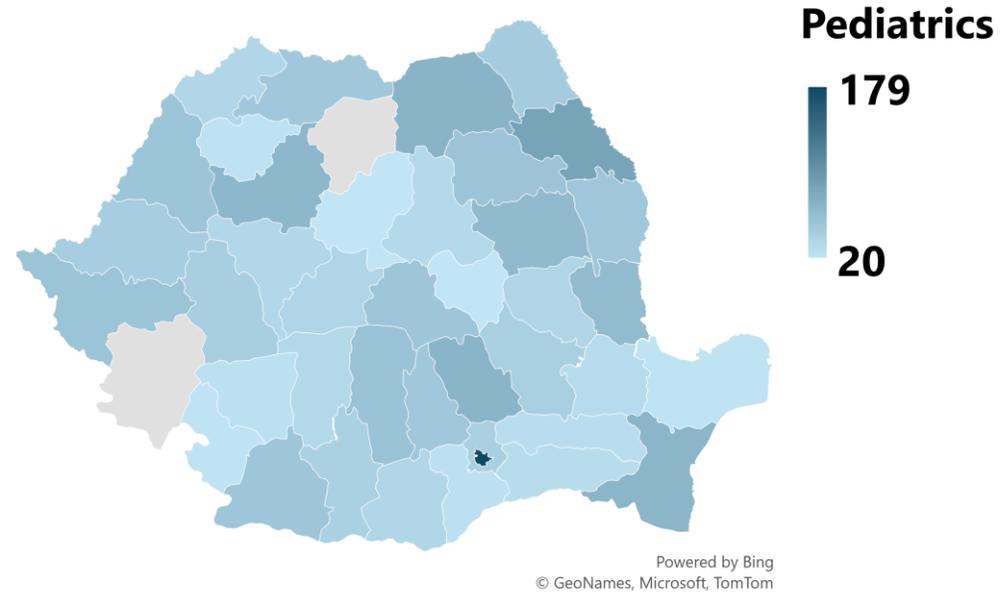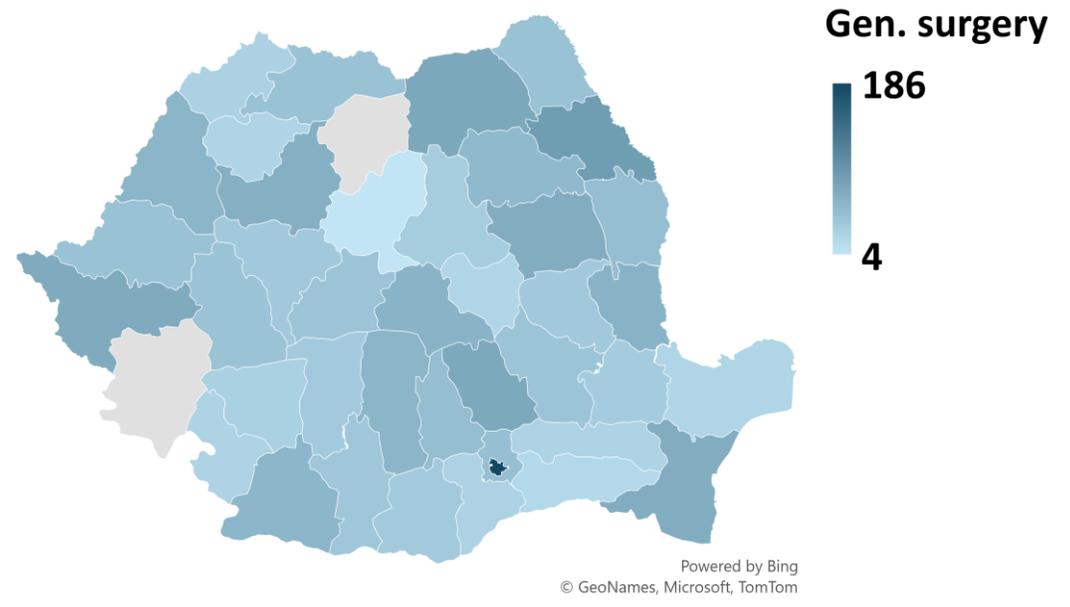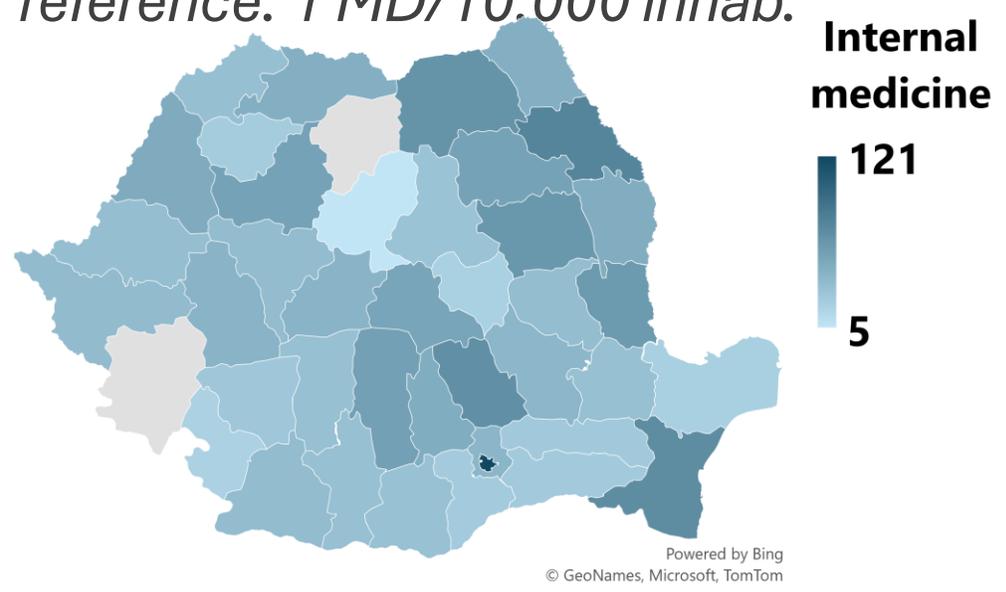
Hospital services – daycare

Code	M&E Indicator
SPSZ-01	Number of daycare services per 100,000 inhabitants (region/county)
SPSZ-02	Number of daycare services per types per 100,000 inhabitants (region/county)
SPSZ-03	Distribution daycare services per hospital, per region
SPSZ-04	% most frequent 10 types of daycare services of total daycare (region/county/spital)
SPSZ-05	Number of daycare services for *diabetes mellitus*, per 100,000 inhabitants (region/county)
SPSZ-06	Number of daycare services for *cardiovascular diseases*, per 100,000 inhabitants (region/county)
SPSZ-07	Number of daycare services for *cancer*, per 100,000 inhabitants (region/county)

Hospital daycare types as reimbursed per regions, 2019 & 2022
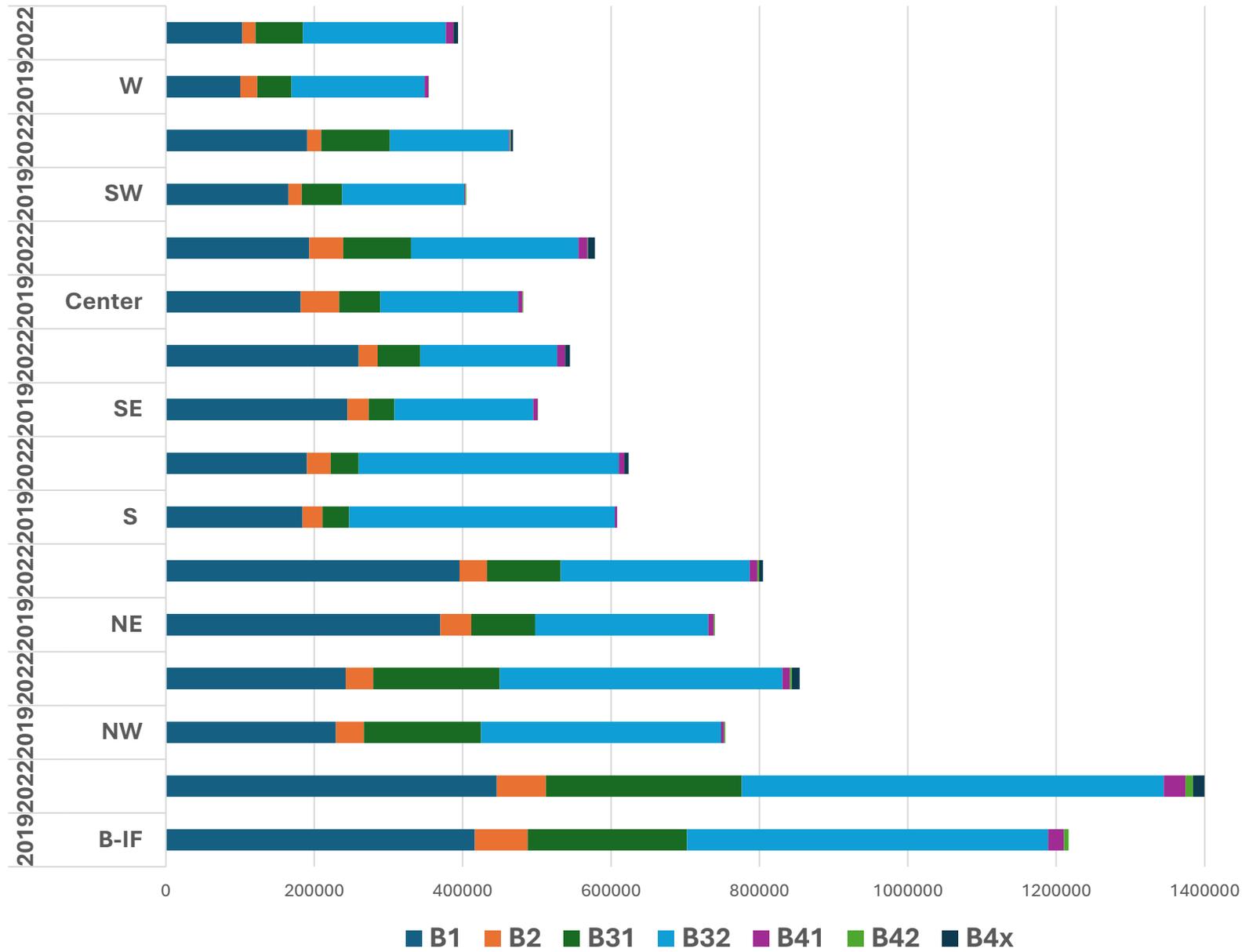
B.1 Medical cases

B.2 Surgical cases

B3.1. Medical services opening medical record

B3.2. Medical services with closed medical record

B4.1 Standardized medical services

B4.2 Standardized medical services, incl. in ambulatory

Legend: ■ B1 ■ B2 ■ B31 ■ B32 ■ B41 ■ B42 ■ B4x

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Hospital acute care (inpatient)

| Code	M&E Indicator
SPAC-01	% cases admitted in acute hospital ward without referral from family dr.
SPAC-02	% **cases admitted as emergencies** in acute hospital wards
SPAC-03	% *avoidable admissions* in total hospital admissions
SPAC-04	% avoidable admissions in acute care hospital admissions
SPAC-05	**% cases from outside region** admitted in acute care wards
SPAC-06	Number of hospital **beds** approved for acute care, per 100,000 inhabitants
SPAC-07	Number of hospital beds contracted for acute care, per 100,000 inhabitants
SPAC-08	Number of **cases** discharged from acute hospital wards per 100 inhabitants
SPAC-09	**Bed occupancy rate**, acute care, 365 days
SPAC-10	Bed occupancy rate, acute care, 290 days
SPAC-11	**Case-mix index**, per specialties
SPAC-12	% variation of hospital discharges comparative with reference year (2023)
SPAC-13	*Pabon-Lasso Model* (*ALOS + BOR + Turnover*)
SPAC-14	% variation of *nosocomial infections* in cases discharged, comparative with reference year
SPAC-15	% variation of *avoidable admissions* and one-day DRGs in acute inpatient care wards, comparative with reference year
SPAC-16	% variation of patients from outside region, discharged from region counties (except transfers)
SPAC-17	Number of *physicians* in contract with HIF working in hospital and in their ambulatory

Hospital chronic care (inpatient)

| Code	M&E Indicator
SPCR-01	Number of **hospital beds approved in long-term-care** hospital wards (LTC) per 100,000 inhabitants
SPCR-02	Number of hospital beds approved in **rehabilitation** hospital wards (REHAB) per 100,000 inhab
SPCR-03	Number of hospital beds approved in **palliative care** hospital wards (PAL) per 100,000 inhabitants
SPCR-04	Number of **cases discharged** from hospital chronic wards (LTC, REHAB, PAL), per 100 inhabitants
SPCR-05	**% cases from outside county**, discharged from hospital chronic care ward (LTC, REHAB, PAL)
SPCR-06	**% cases from outside region**, discharged from hospital chronic care wards (LTC, REHAB, PAL)
SPCR-07	**Bed occupancy rate**, chronic care wards (LTC, REHAB, PAL), 365 days
SPCR-08	**ALOS** of cases discharged from hospital chronic care wards (LTC, REHAB, PAL)
SPCR-09	**Number of new hospital beds** approved for chronical care - LTC, REHAB, PAL, transferred from acute care (according to necessary / deficits)

Hospital chronic care

No.	Code	Hospital ward	Type	Tariff/day 2023 (Lei)	ALOS (2022)
1.	1061	Chronical	LTC	229.82	10.81
2.	1121	Geriatrics and gerontology	LTC	198.25	11.86
3.	1222	Neonatology prematures	REAB	515.00	15.09
4.	1222.1	Neonatology prematures - maternity degree II	REAB	664.11	13.11
5.	1222.2	Neonatology prematures - maternity degree III	REAB	1107.54	19.71
6.	1272	Pediatric rehabilitation	REAB	230.73	23.27
7.	1282	Chronic - pediatrics	REAB	322.25	8.30
8.	1301	Pneumoftisiology (pneumology & Tb)	LTC	232.03	29.86
9.	1302	Pediatric pneumoftisiology	LTC	299.03	17.69
10.	1333.1	Psychiatry - chronical (long term care)	LTC	112.79	365
11.	1333.2	Psychiatry - chronical	LTC	130.13	54.71
12.	1371	Rehabilitation, physical medicine & balneology	REAB	234.25	11.17
13.	1372	Rehabilitation, physical medicine & balneology - children	REAB	125.75	27.84
14.	1383	Cardiovascular medical rehabilitation	REAB	235.36	11.26
15.	1393	Neurological medical rehabilitation	REAB	252.34	12.79
16.	1403	Orthopedics-traumatology rehabilitation	REAB	311.21	10.45
17.	1413	Respiratory rehabilitation	REAB	297.38	10.07
18.	1423	Neuro-psychomotor rehabilitation	REAB	239.79	14.41
19.	1061PAL	Palliative care	PAL	273.08	31.64
20.	1393REC	Medical rehabilitation	REAB	244.71	10.34

Hospital beds/100,000 in European countries

- year 2019
- year 2021

data source: Eurostat, OECD
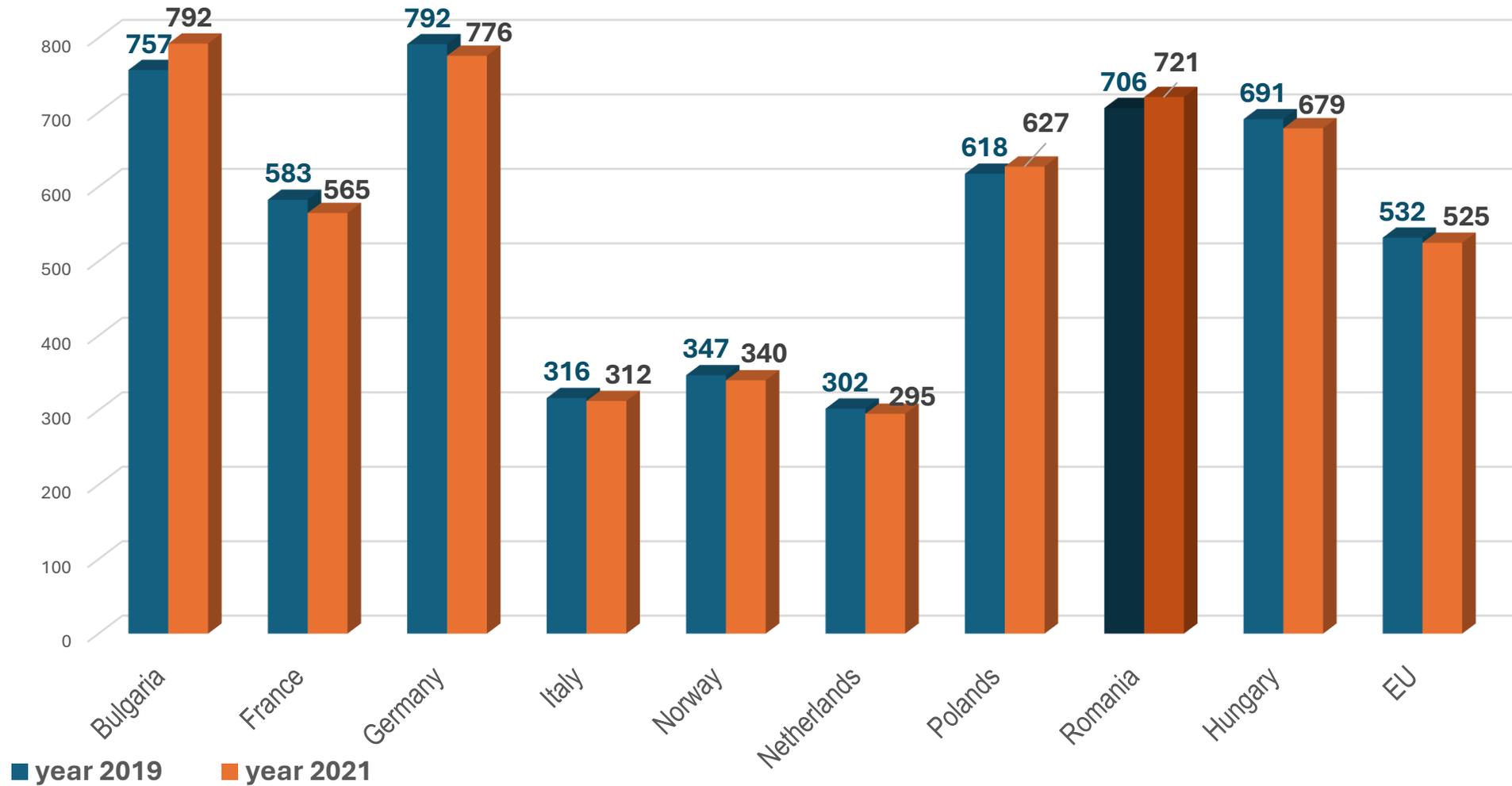
Romania: hospital beds /100,000, regions, 2019

**acute** **chronic**

Long term care, rehabilitation, palliation beds
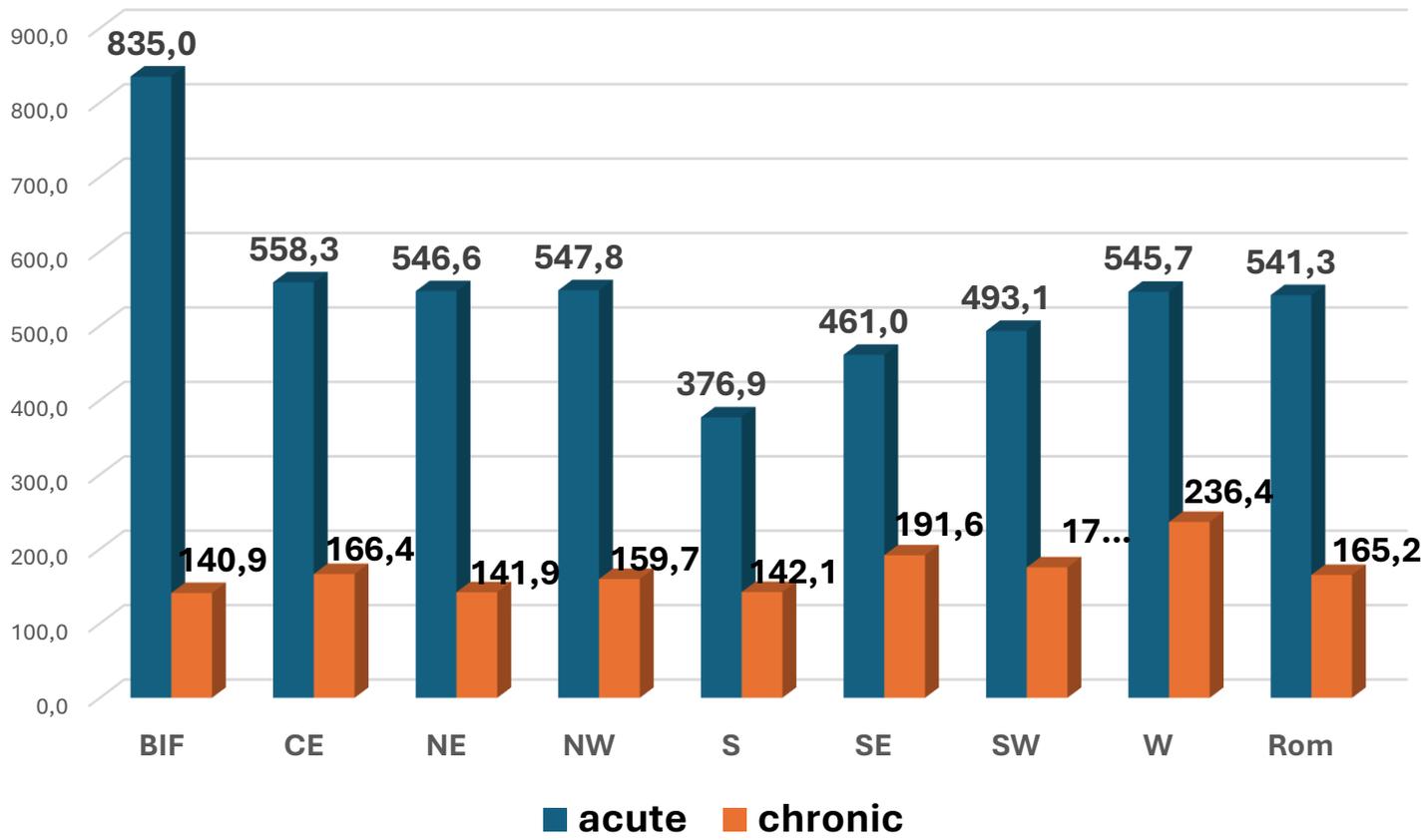
Recommended for chronic care:

170 beds for LTC / 100,000 inh.

30 beds for REAB / 100,000 inh.

20 beds for PAL la 100,000 inh.
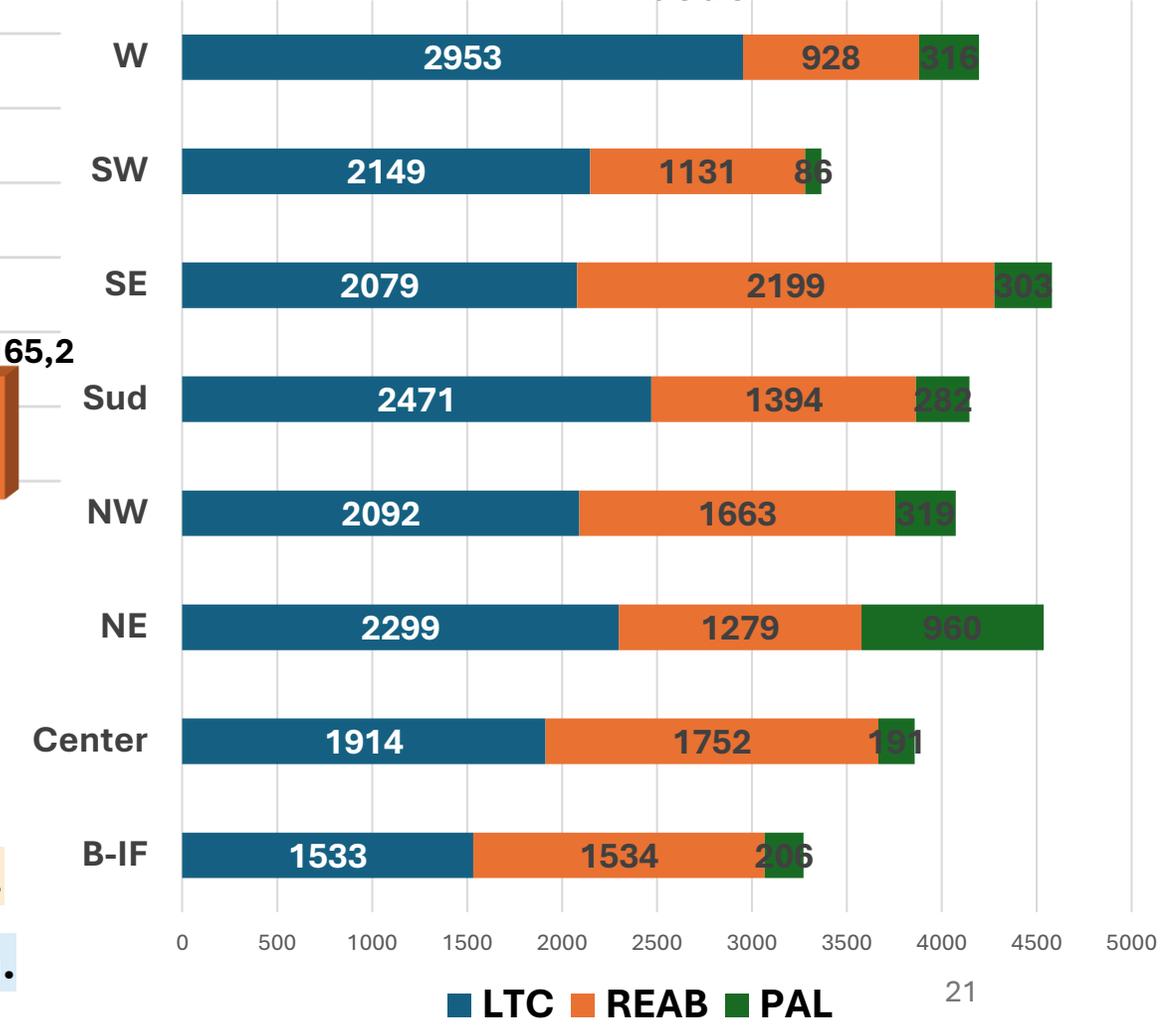
data sources: NHIF, NIS

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Hospital bed occupancy rate (%), regions, 2019

data sources: NIHSM, NIS
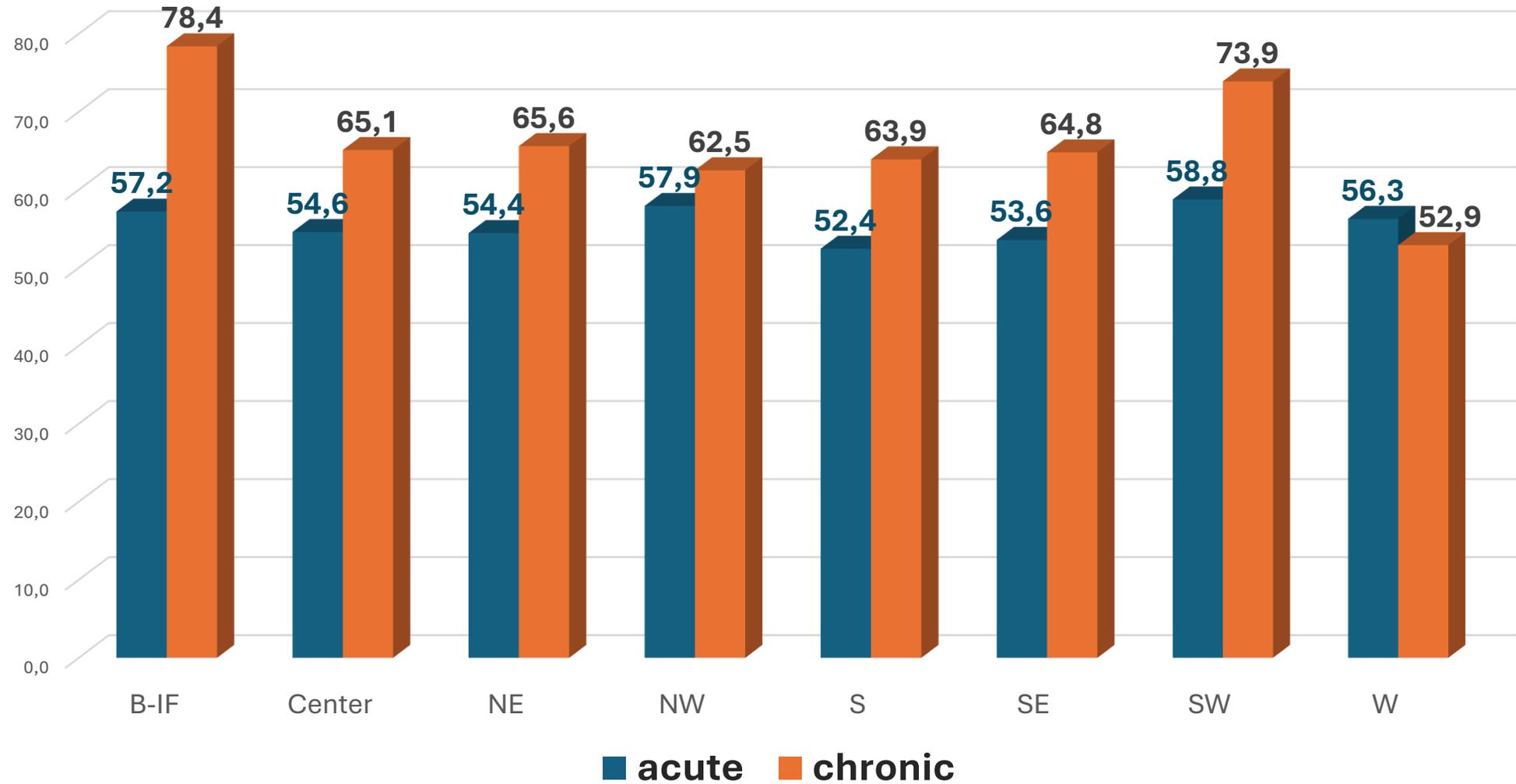
Hospital discharge rate (cases/100 inhab.), regions, 2019

data sources: NIHSM, NIS

ALOS (days), regions, 2019

Chart 1 — chronic vs acute ALOS by region:

Region	chronic	acute
B-IF	14,88	5,19
Cent...	21,30	5,81
NE	18,03	6,06
NW	16,71	5,87
S	18,67	5,84
SE	17,30	5,73
SW	22,11	5,85
W	23,90	5,93
Rom.	20,18	5,74

Chart 2 — LTC, REAB, PAL by region:

Region	LTC	REAB	PAL
B-IF	17,62	12,83	11,23
Centru	41,66	13,84	13,96
NE	27,52	11,87	34,22
NW	28,13	11,77	19,40
S	26,90	12,75	29,58
SE	29,19	11,49	34,28
SW	40,04	11,38	35,57
W	36,47	12,51	24,09

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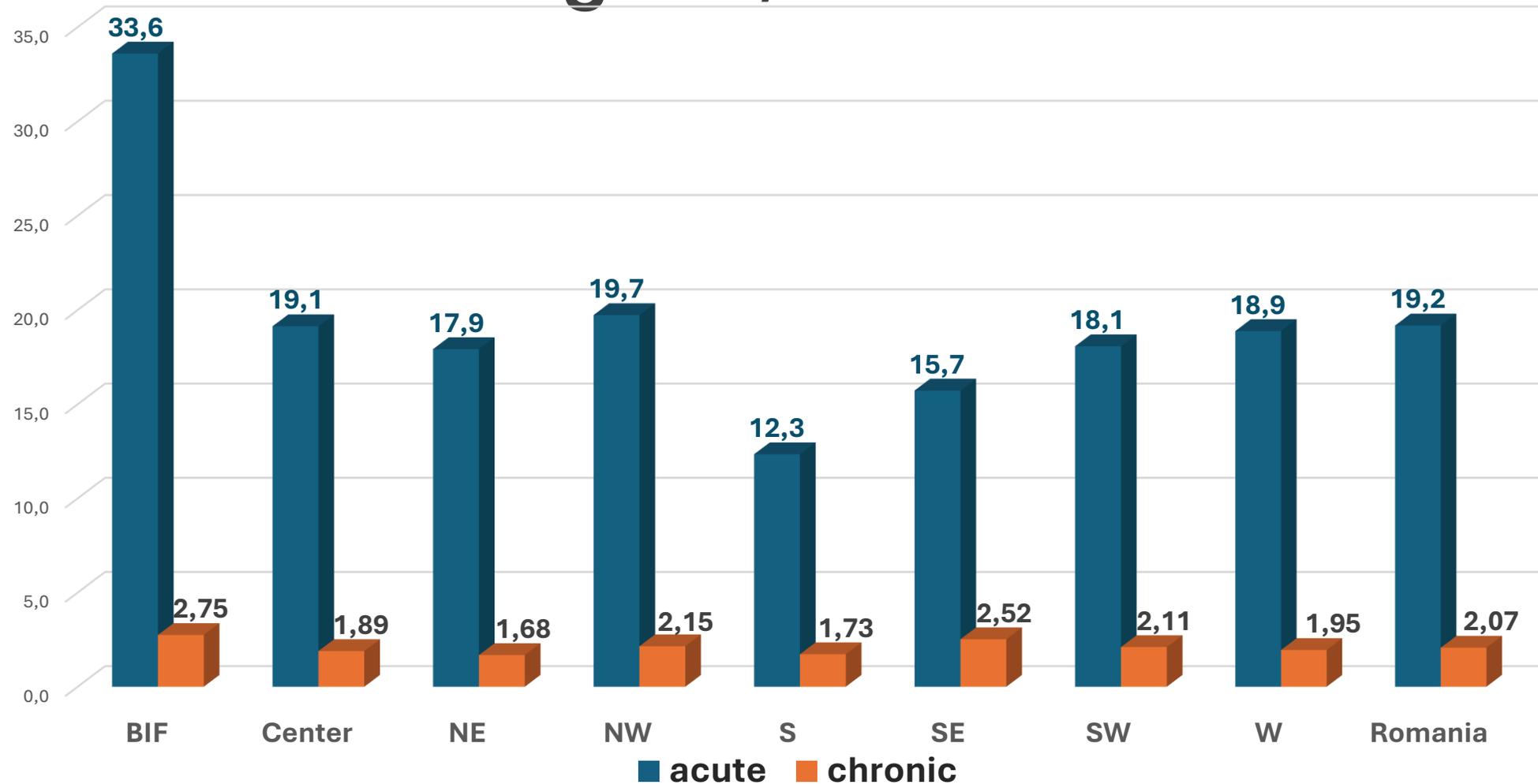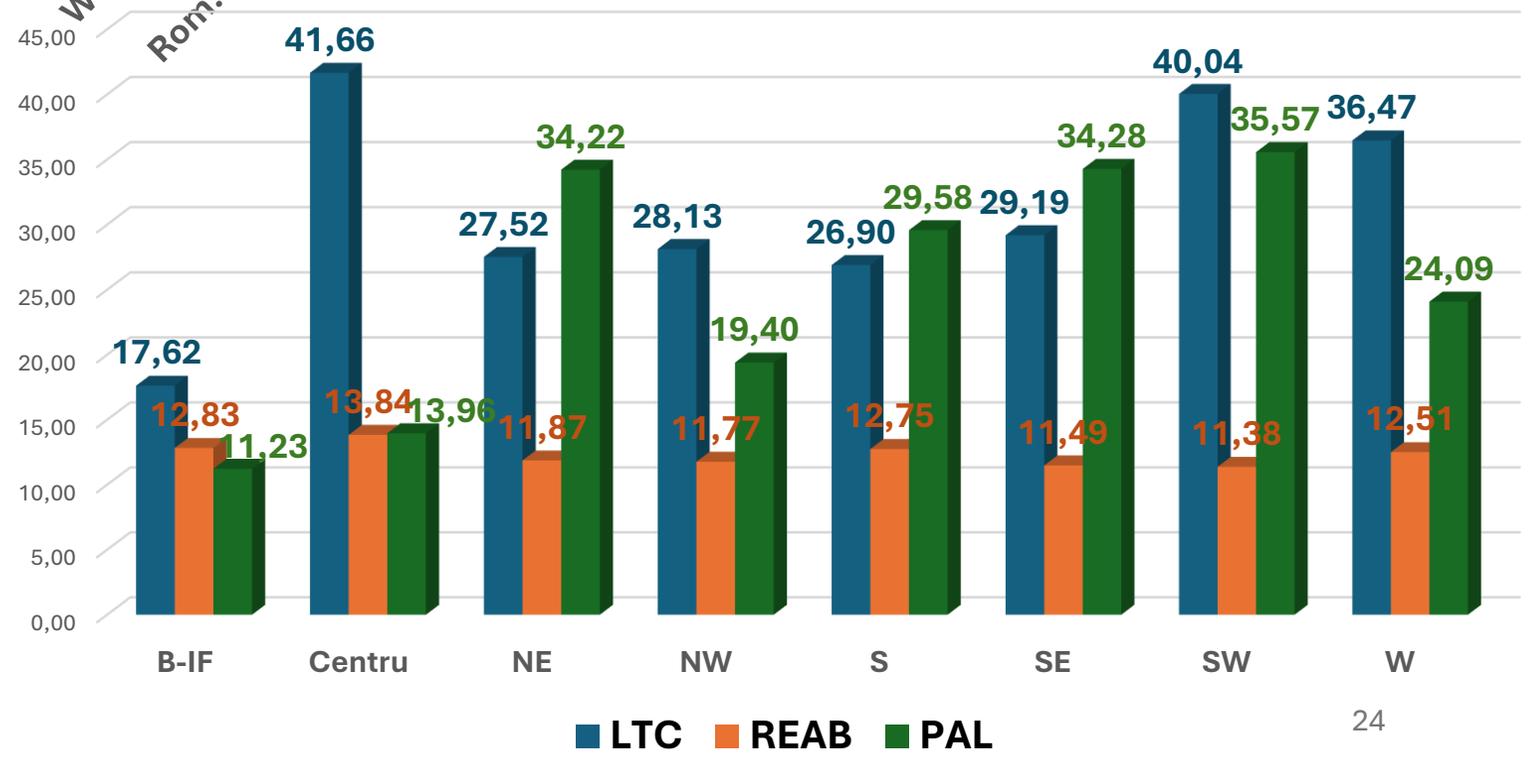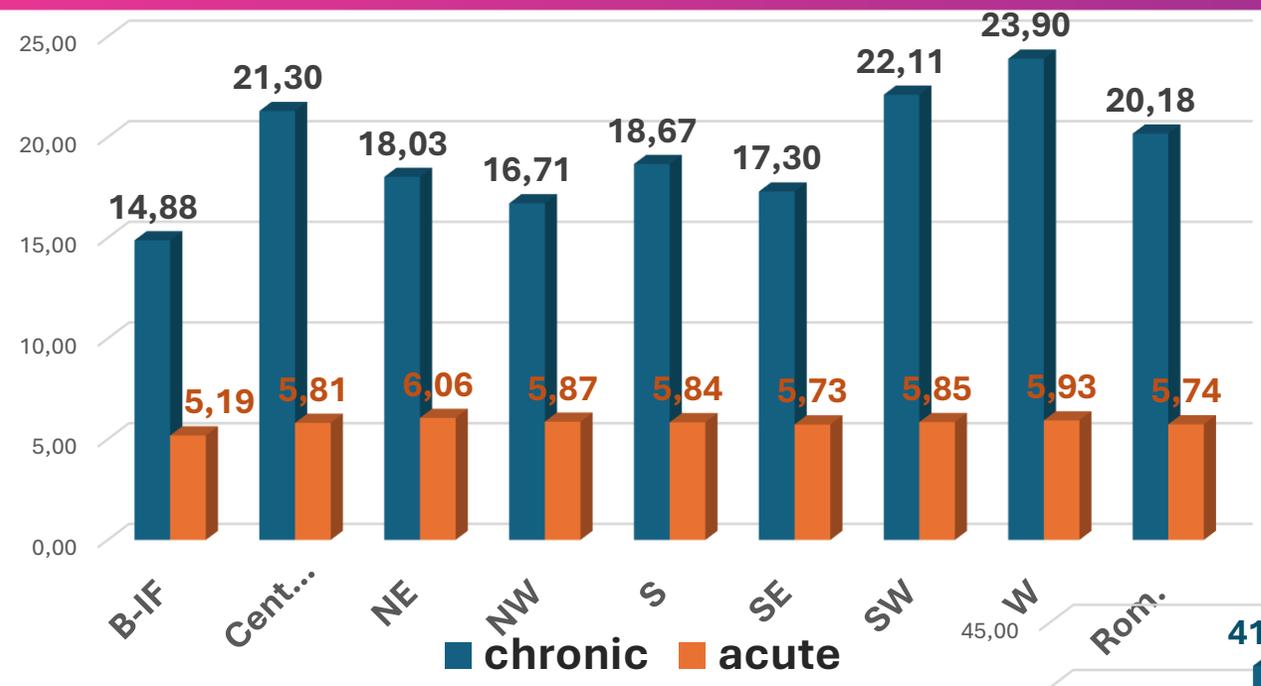
Case-mix index, regions, 2019
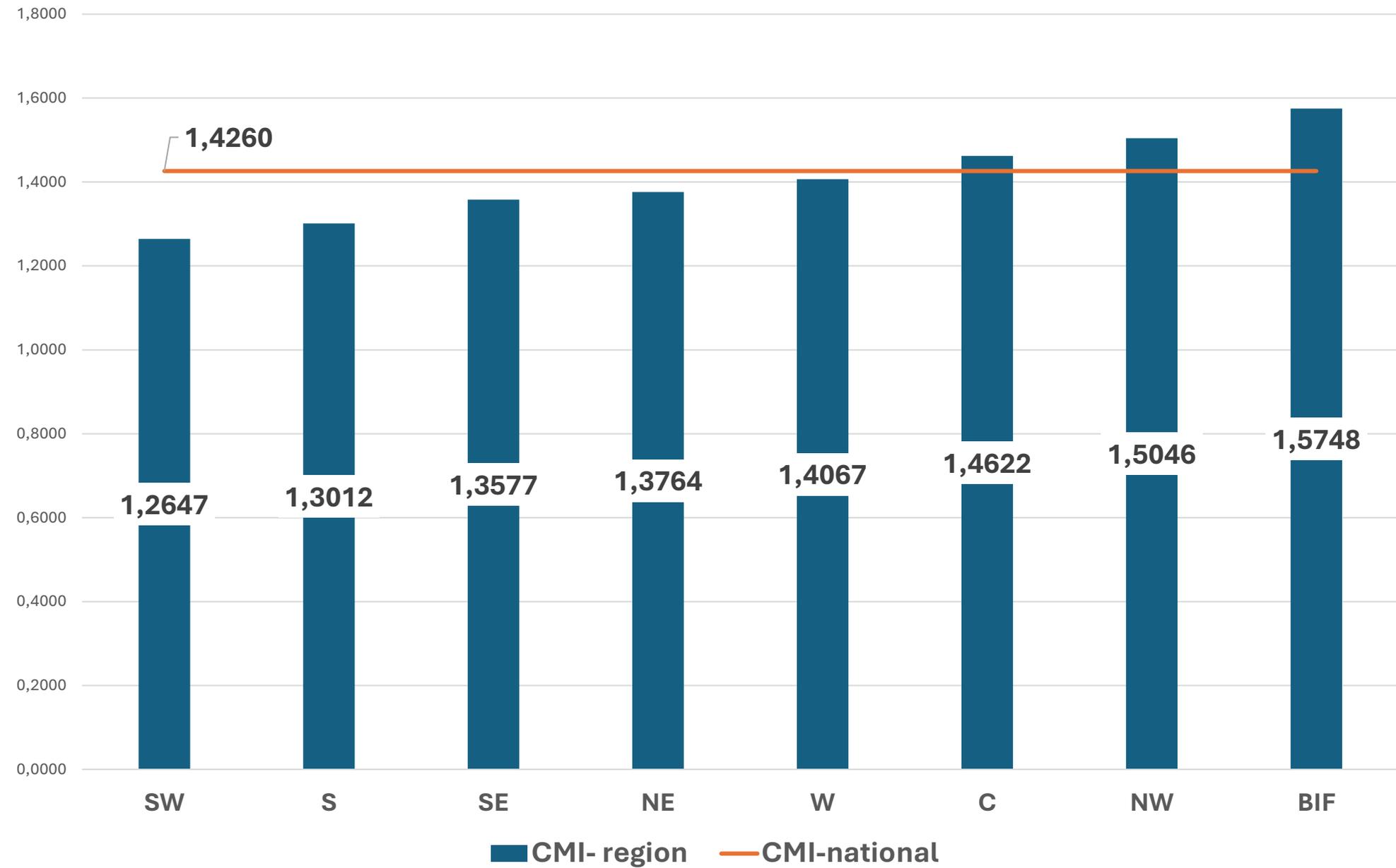
Emergency medical services

Code	Indicator
SURG-01	Number of **county ambulance service stations**, per 10.000 inhabitants
SURG-02	Number inhabitants living in localities situated **over 50 km from ambulance station**
SURG-03	% new ambulances of total medical ambulances, within reporting period
SURG-04	% ambulances of high obsolescence (wear and/or tear) of total ambulances, within reporting period
SURG-05	**Deficit/surplus of emergency specialist physicians** according to current normative
SURG-06	**Deficit/surplus of emergency nurses** according to current normative
SURG-07	**% red code cases** with overtime response compared to normative, in total red code cases
SURG-08	**% yellow code cases** with overtime response compared to normative, in total yellow code cases

Public hospital infrastructure – *buildings*

Code	Indicator
INFR-01	number of hospital **buildings built before 1978**
INFR-02	number of hospital buildings built before 1978 **requesting technical expertise**
INFR-03	number of hospital buildings built before 1978 with **technical expertise performed**
INFR-04	number of hospital buildings **assessed in 1st and 2nd level of seismic risk**
INFR-05	number of hospital buildings owned by the hospital, **registered in the land register**
INFR-06	total number of **hospital buildings owned** by the hospital
INFR-07	number of hospital medical/mixed buildings requiring **thermic isolation**
INFR-08	number of buildings (medical/mixed) requiring **extension**
INFR-09	number of new hospital buildings necessary for medical activity
INFR-10	number of buildings (medical/mixed) requiring capital **repairs/rehabilitation**
INFR-11	number of buildings (medical/mixed) requiring rehabilitation of **electrical wiring**
INFR-12	number of buildings (medical/mixed) requiring rehabilitation of **plumbing**
INFR-13	number of buildings (medical/mixed) requiring rehabilitation of **heating system**
INFR-14	number of buildings (medical/mixed) requiring rehabilitation of **wastewater treatment plant**
INFR-15	number of buildings (medical/mixed) requiring rehabilitation of **air purifier system**
INFR-16	number of buildings (medical/mixed) requiring rehabilitation of **air circulation system**
INFR-17	number of buildings (medical/mixed) requiring rehabilitation of **elevators**
INFR-18	number of buildings (medical/mixed) requiring installation/rehabilitation of water heating plant from regenerable sources (solar panels)
INFR-19	number of buildings (medical/mixed) requiring installation/rehabilitation of electrical power-generation facility from regenerable sources (photovoltaic panels)

Public hospital infrastructure – *equipment*

Code	Indicator
INFR-20	number of **CT**s / 100,000 inhabitants
INFR-21	number of **PET-CT**s / 100,000 inhabitants
INFR-22	number of **MRI**s / 100,000 inhabitants
INFR-23	number of **angiographs** /100,000 inhabitants
INFR-24	number of **GAMMA cameras** / 100,000 inhabitants
INFR-25	number **mammographs** / 100,000 inhabitants
INFR-26	number of **radiotherapy equipment** / 100,000 inhabitants
INFR-27	number of **Array spectral density equipment** / 100,000 inhabitants
INFR-28	number of **LSI**/ 100,000 inhabitants
INFR-29	number of CT requiring replacement in public hospitals
INFR-30	number of PET-CT requiring replacement in public hospitals
INFR-31	number of MRI requiring replacement in public hospitals
INFR-32	number of angiographs requiring replacement in public hospitals
INFR-33	number of GAMMA cameras requiring replacement in public hospitals
INFR-34	number of mammographs requiring replacement in public hospitals
INFR-35	number of radiotherapy equipment requiring replacement in public hospitals
INFR-36	number of Array spectral density equipment requiring replacement in public hospitals
INFR-37	number of LSI requiring replacement in public hospitals

Conclusions

- **M&E RHSM**: first national comprehensive dataset of healthcare indicators at provider, county, region and national level, generating many data reports

- **Unitary data platform** for all health interventions and their outcomes

- Objective, standard **MEASUREMENT** for current situation (health resources, services use, deficits, provider and patient behaviors, population health etc.), objectives & targets of masterplans, thus improving transparency and predictability

- Useful complex **tool** developed to coordinate health interventions, programs and initiatives

- Basis for **informed decisions for RHSM interventions** in healthcare and for other sectors (NRRP, Ro National Health Program, Romania Sustainable development etc.)

- Measurement of direct results/impact on health (of health sector initiatives) & indirect (of the other sectors initiatives), using **ONE HEALTH** approach

- RHSM - piece of a larger puzzle: **healthy district/regional/national human development**

- Generating evidences useful for health professionals, experts, researchers etc.

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INS, statistical indicators at county, region and national level, http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table

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*** Law 95/2006 of health reform, republished

*** Government decision 1004/2023 – the National Health Strategy 2022-2030; and Regional master-plans for health services (RMHS)

EHMA 2024

Shaping and managing innovative health ecosystems

Thank you!

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