Islamic Republic of Iran
Ministry of Health and Medical Education
Deputy of Research and Technology

Health in Iran
Burden of Diseases and risk factors

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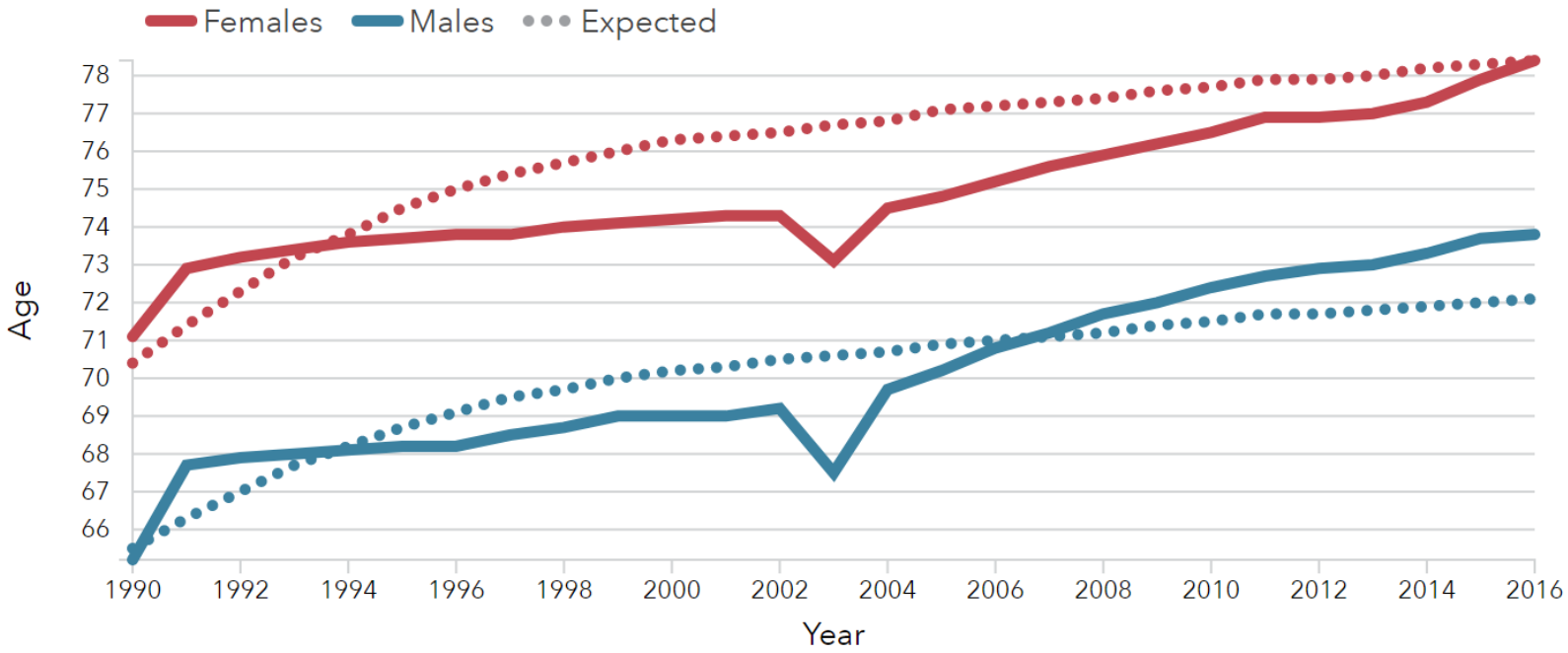
Demographic Information in 2016

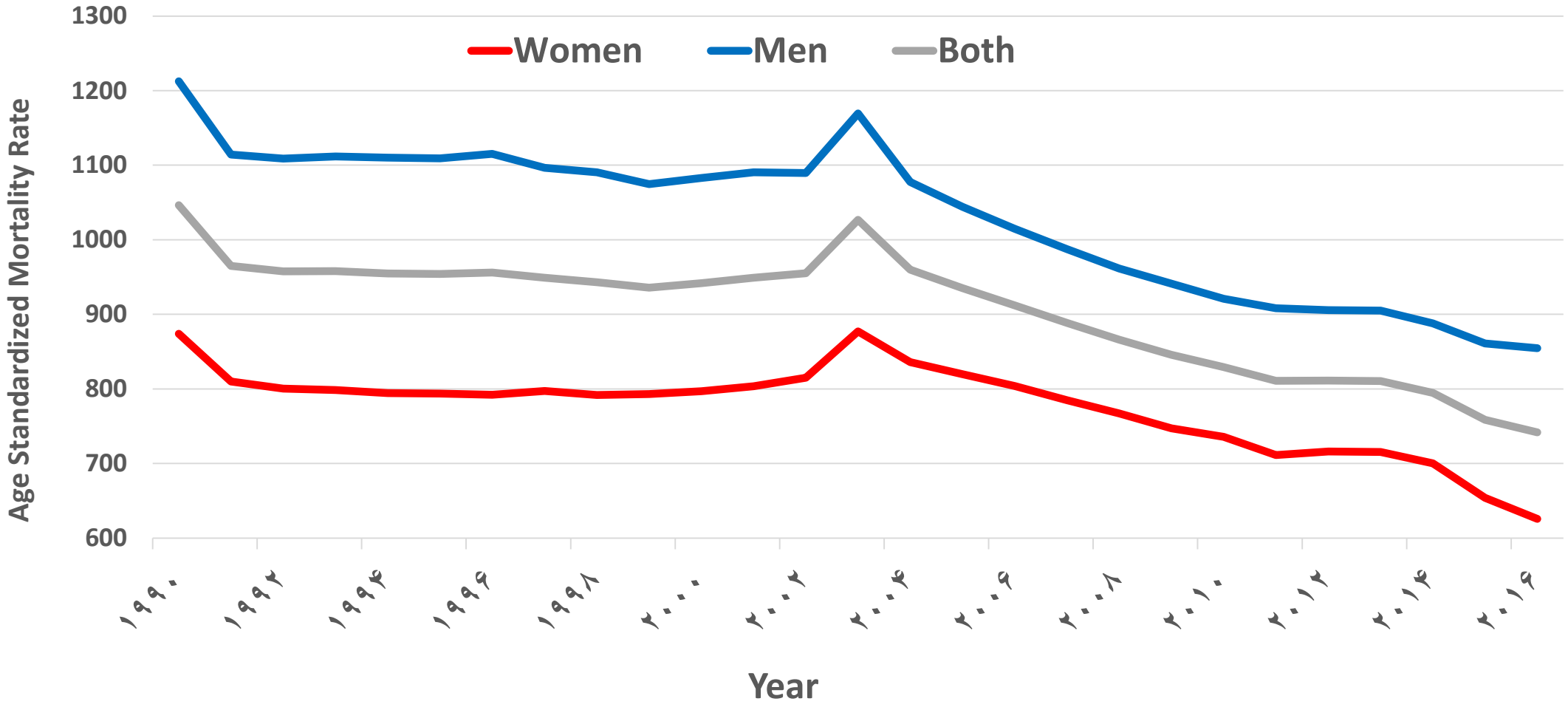
- Population: 81.3 Million
- GDP per capita: 16,000 $
- Fertility Rate: 1.9
- Mean educational attainment: 10.4 years

Life expectancy at birth from 1990 to 2016

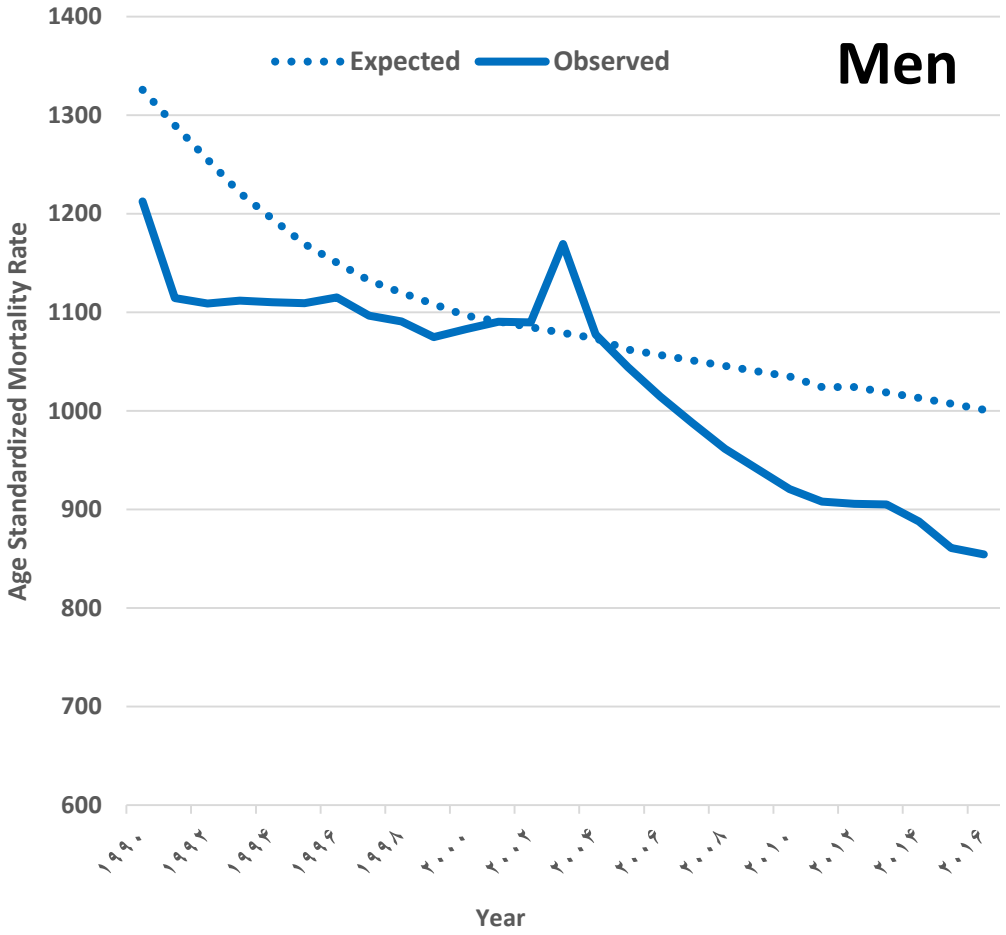


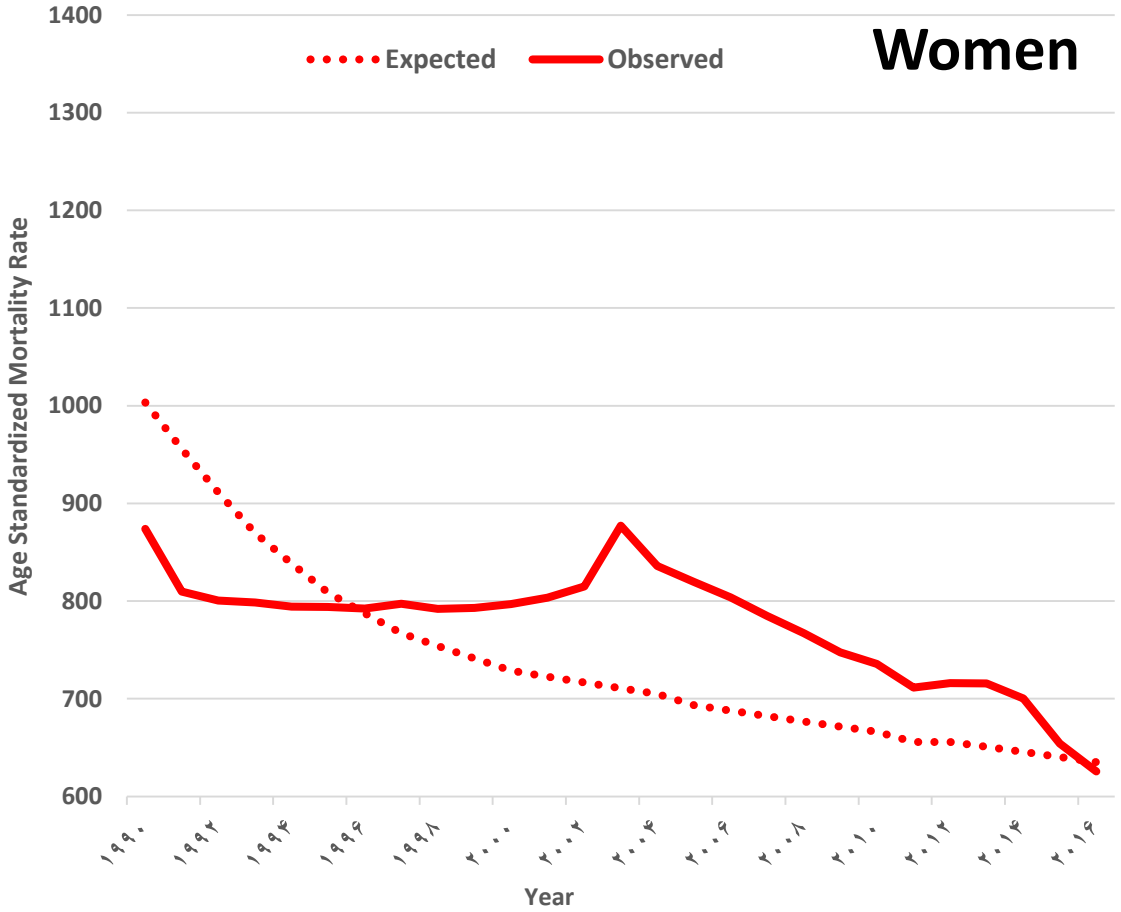
	Expected		Observed	
	1990	2016	1990	2016
Females	70.4	78.4	71.1	78.4
Males	65.5	72.1	65.2	73.8

Mortality Rate in Iran 1990 to 2016

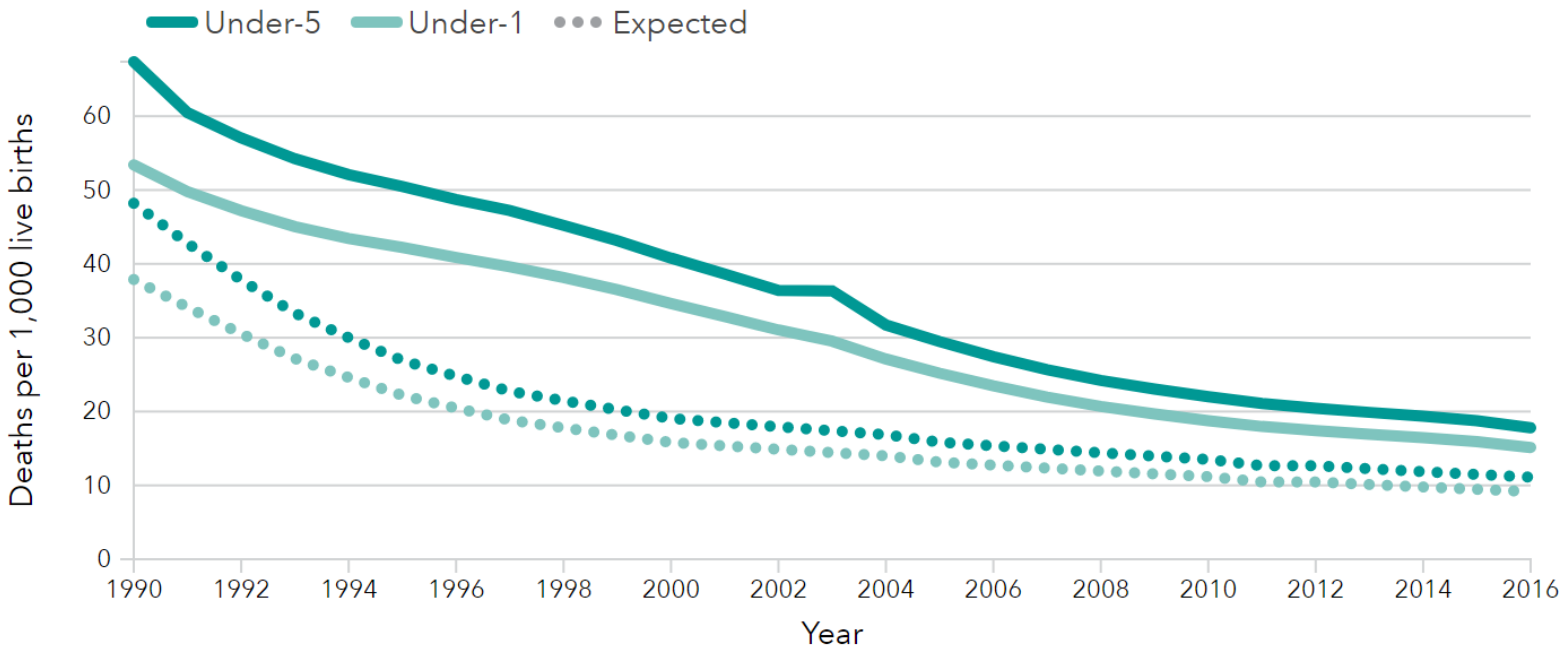


Mortality Rate Trend in Women and Men



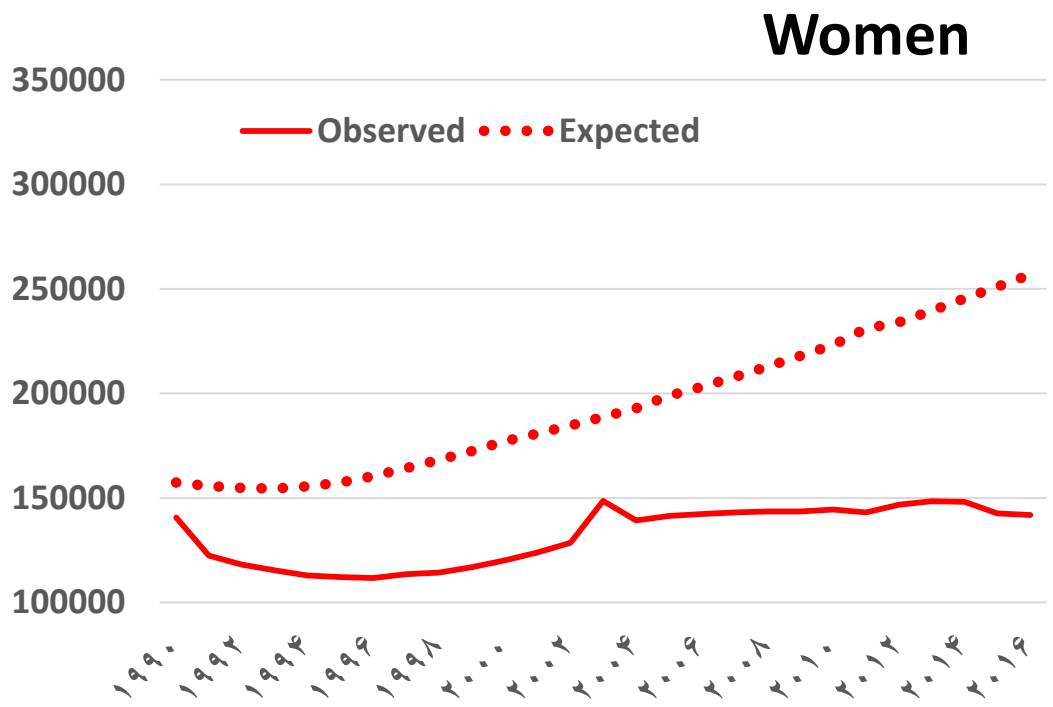


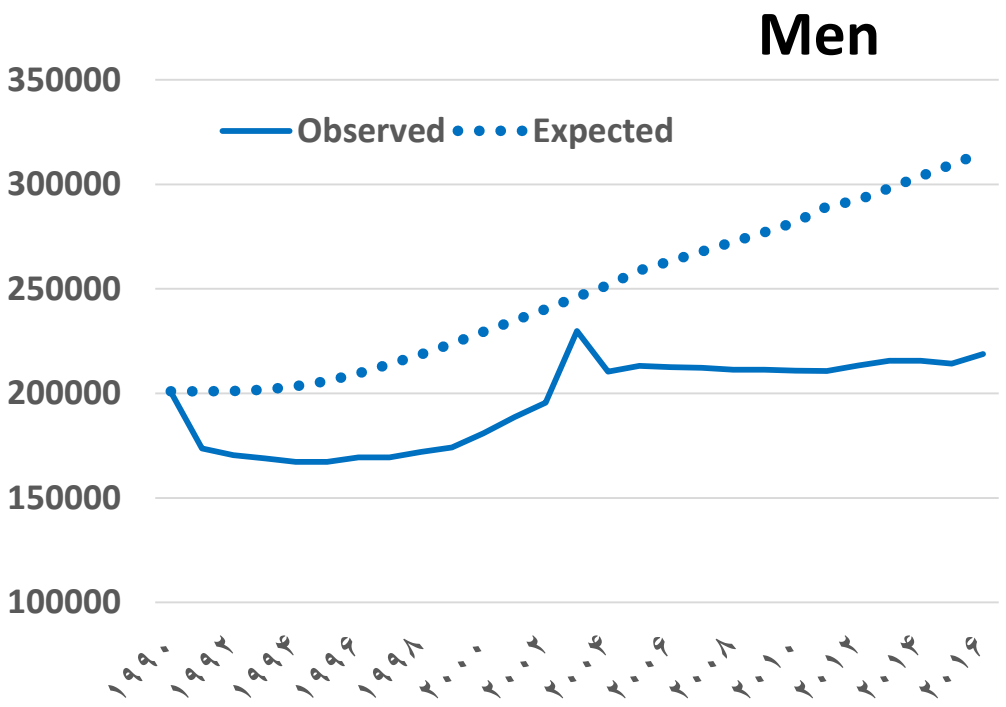
Child Mortality Trend in Iran



	Expected		Observed	
	1990	2016	1990	2016
Under-5	48.2	11.1	67.4	17.8
Under-1	37.9	9.2	53.4	15.1

Mortality Number in All Ages in Iran from 1990 to 2016

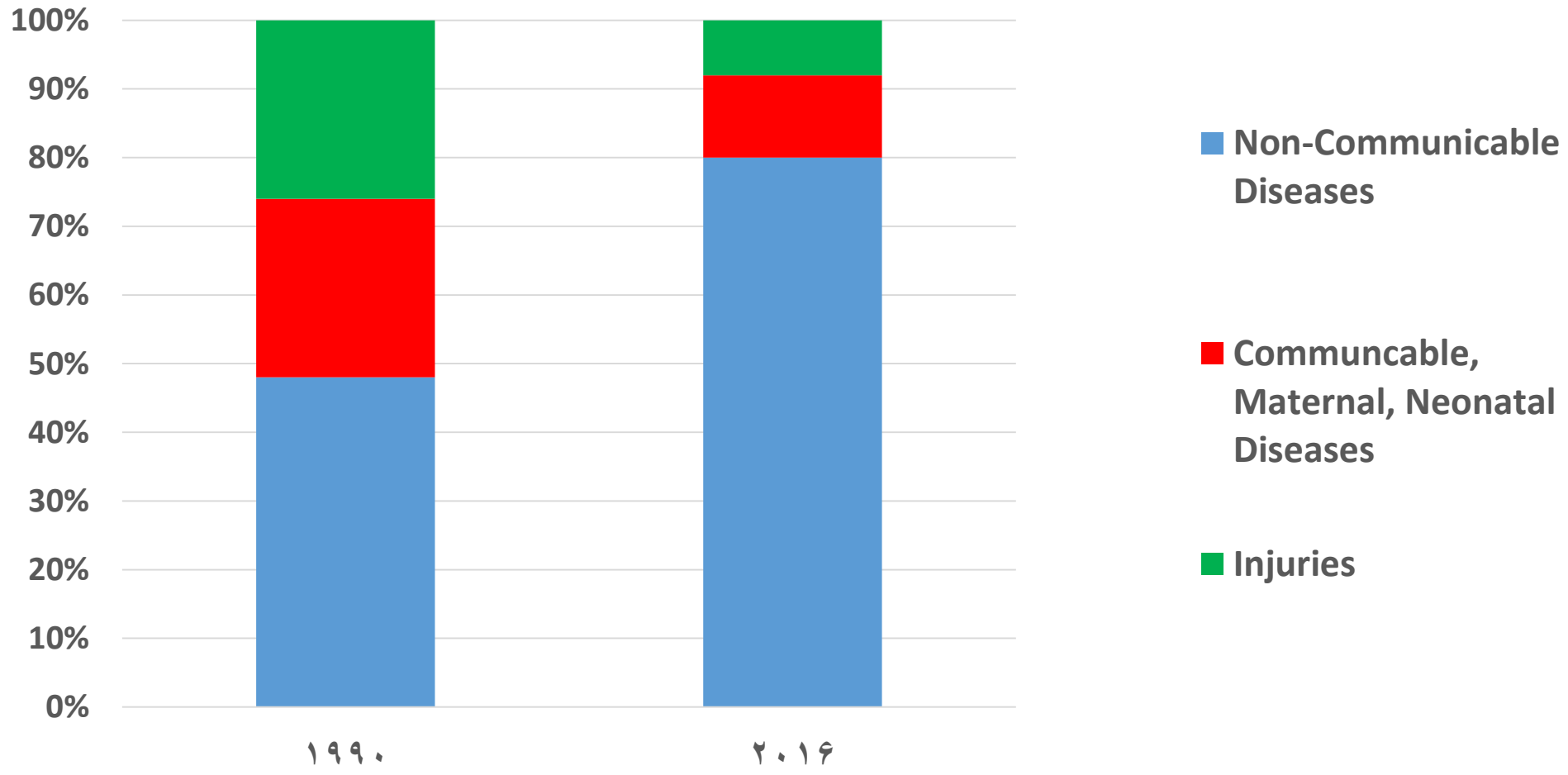




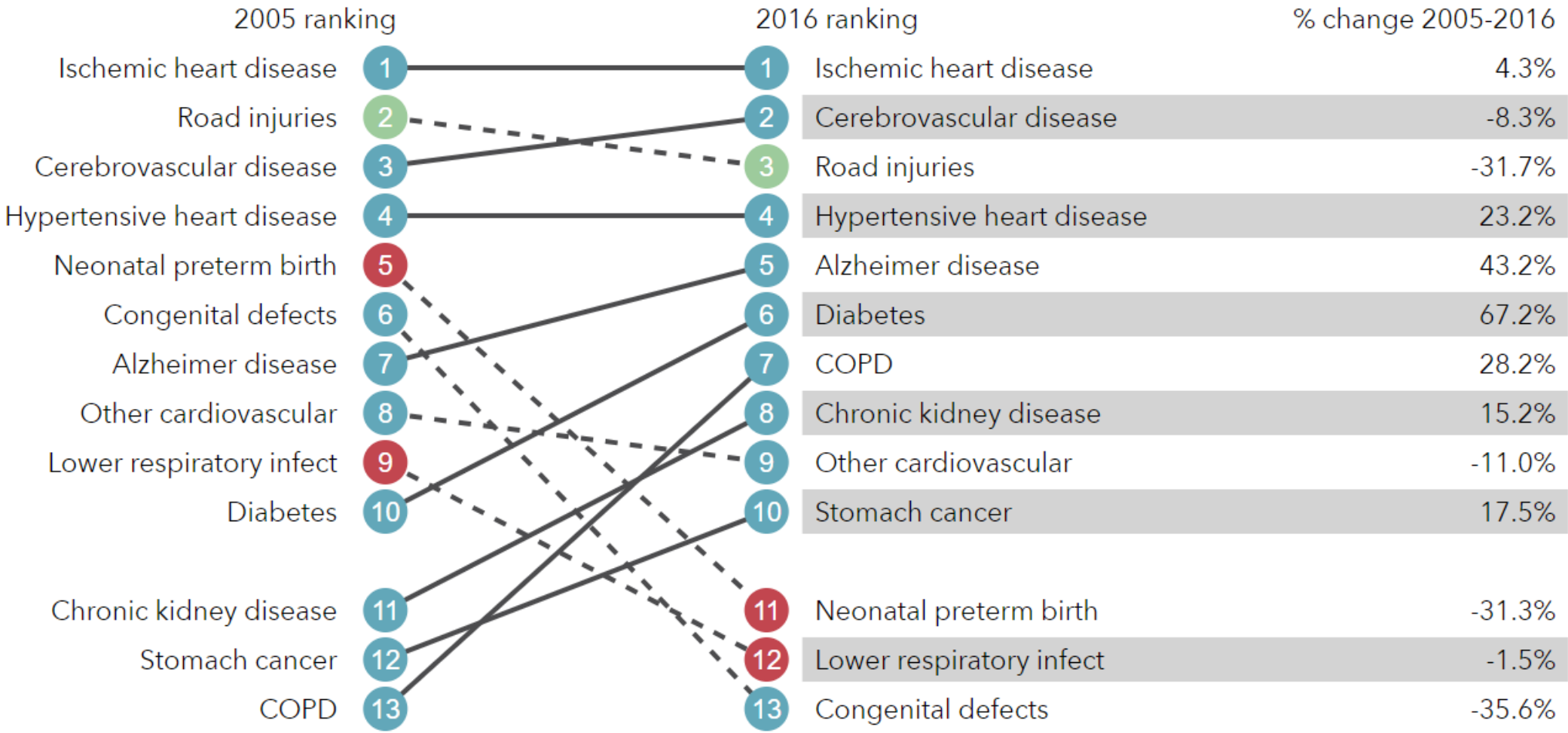
Mortality Number in Iran

	1990	2016
All-Cause Number		
Men	200,000	219,000
Women	140,000	141,000
Total	340,000	360,000
Premature Death N (%)		
Men	164,000 (82%)	124,000 (57%)
Women	113,000 (80%)	69,000 (49%)
Total	277,000 (81%)	193,000 (53%)

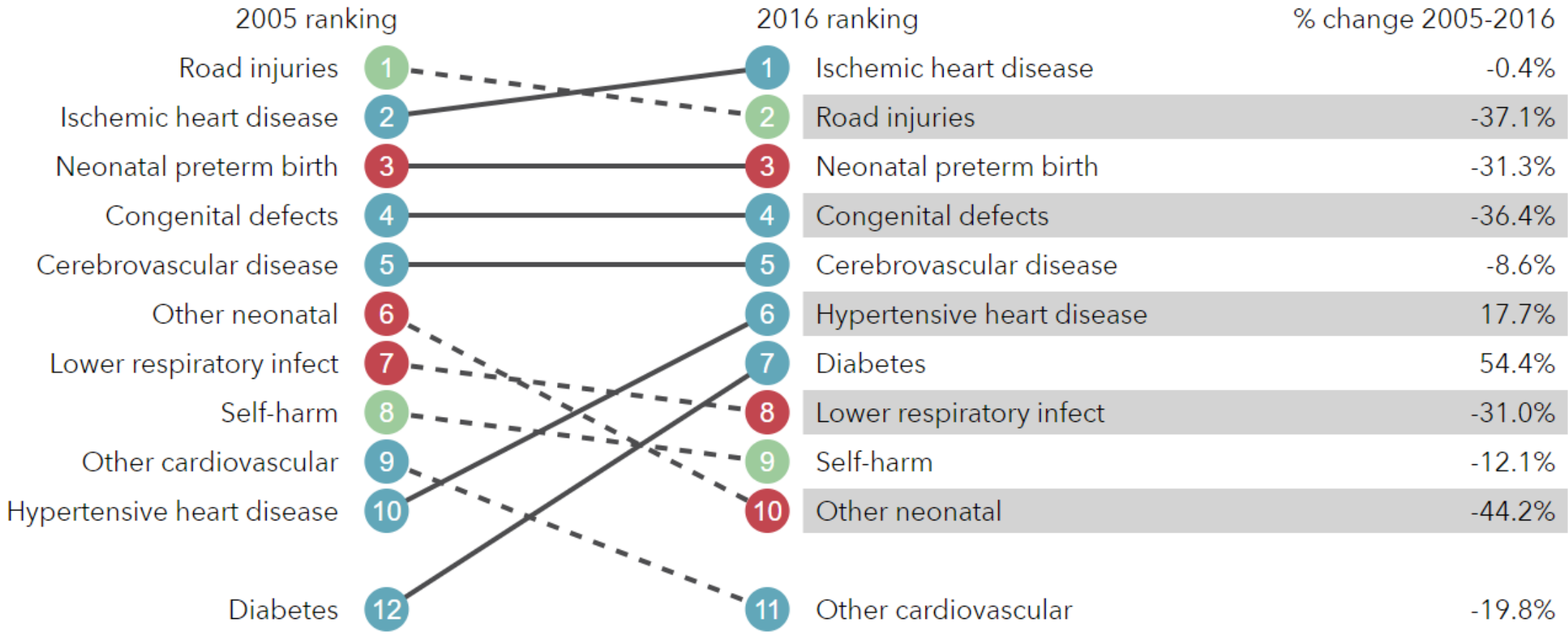
Mortality by Cause in Iran 1990 to 2016



Top 10 Causes of Death in Iran

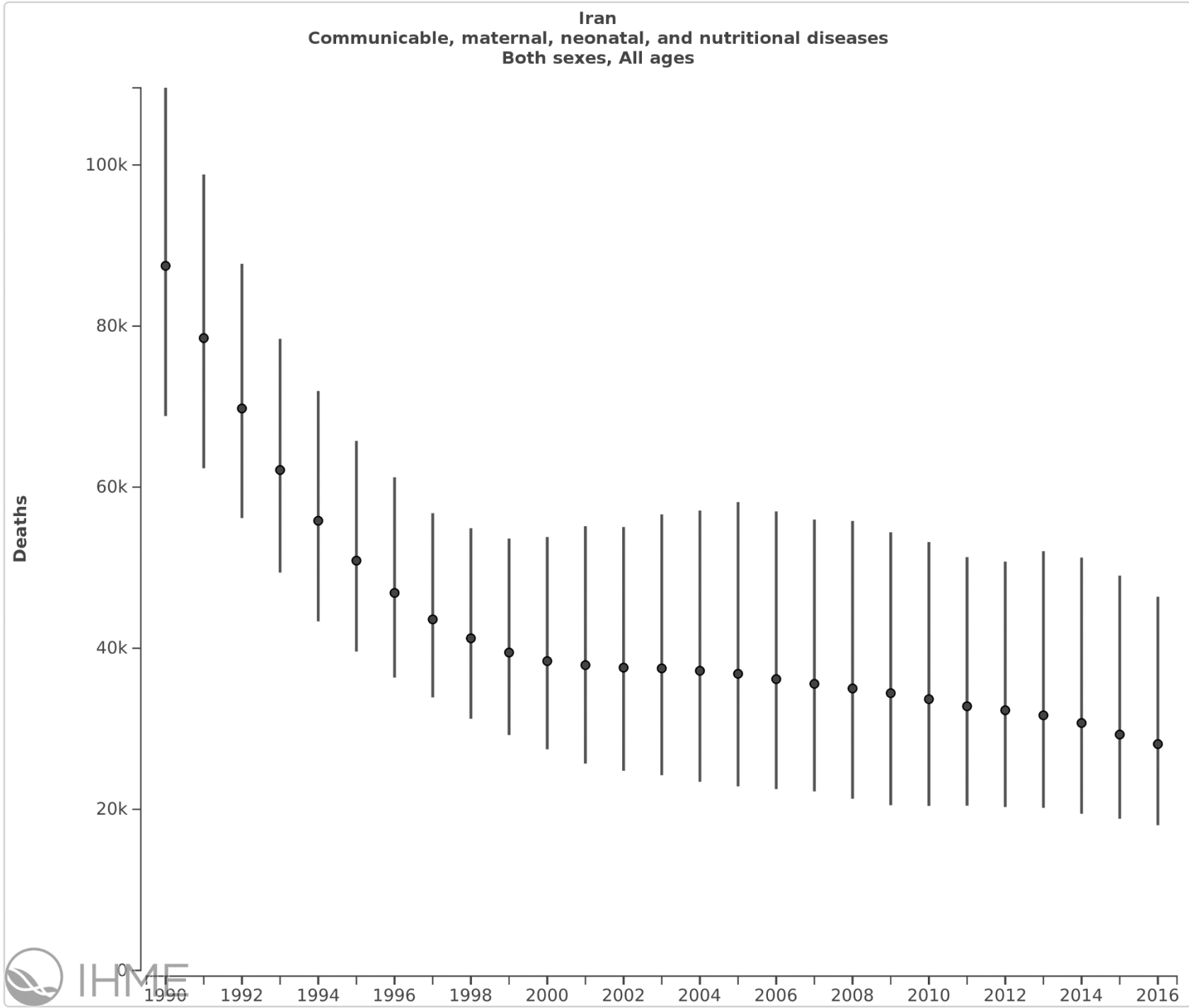


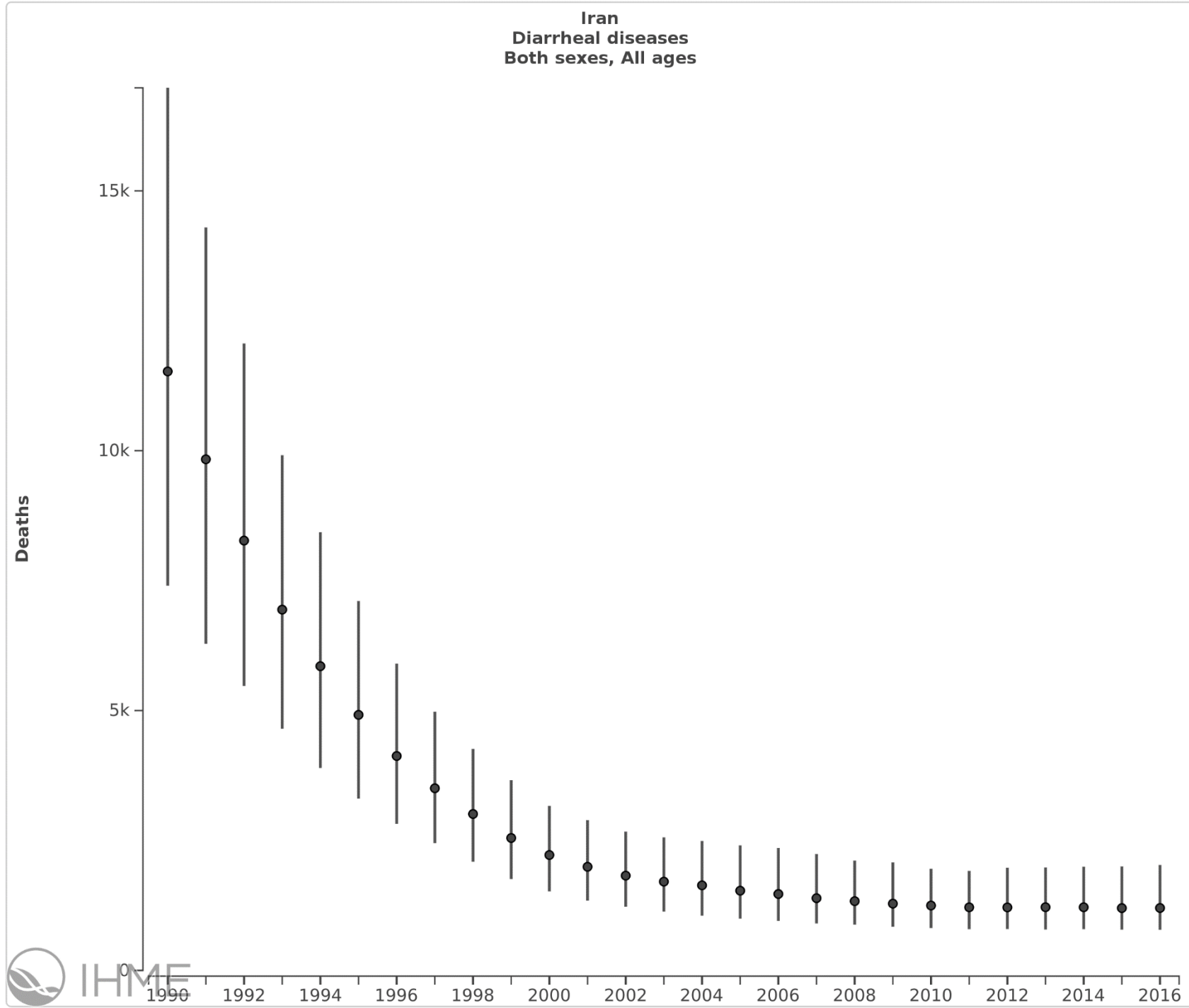
Top 10 Causes of Premature Death in Iran

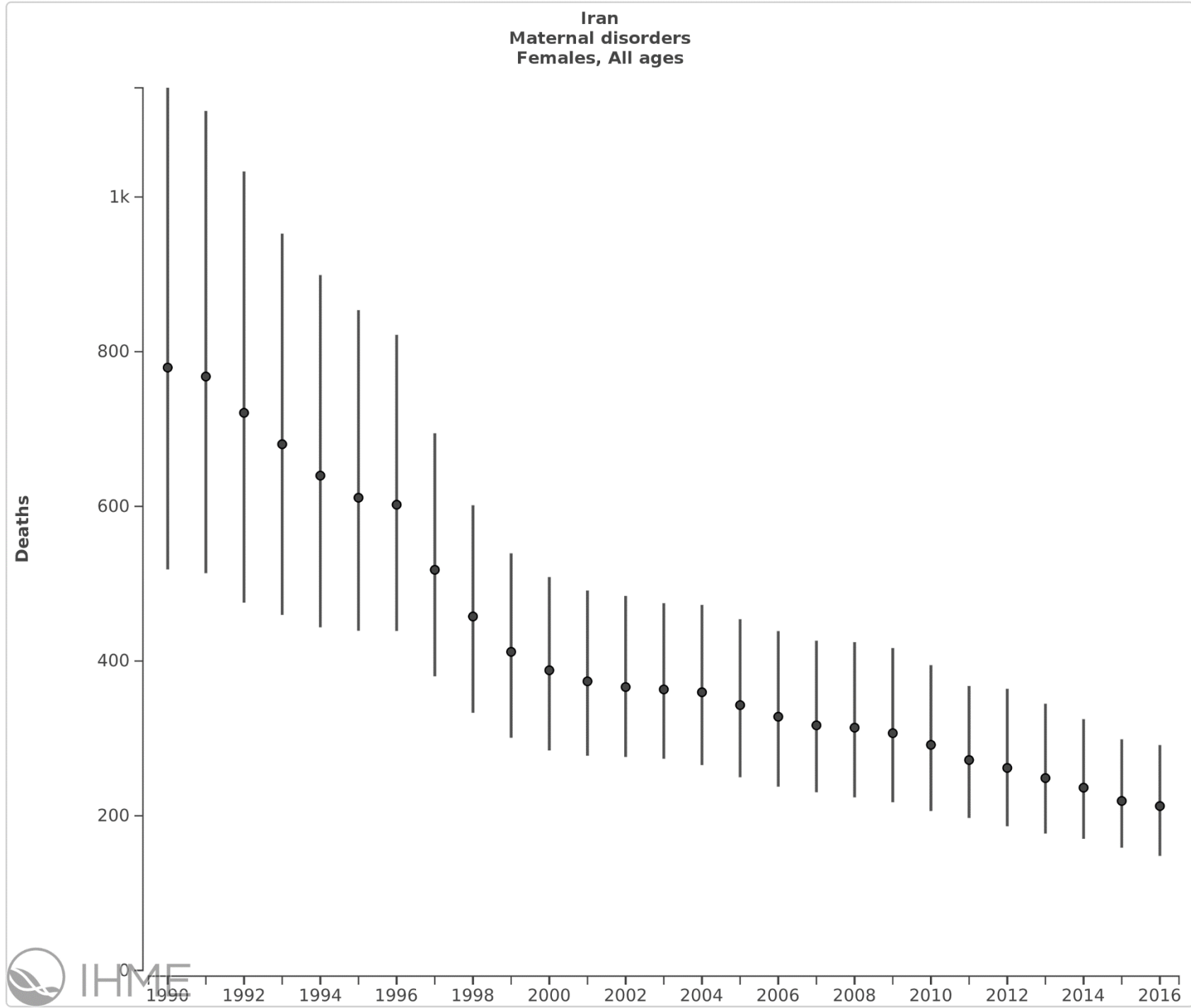


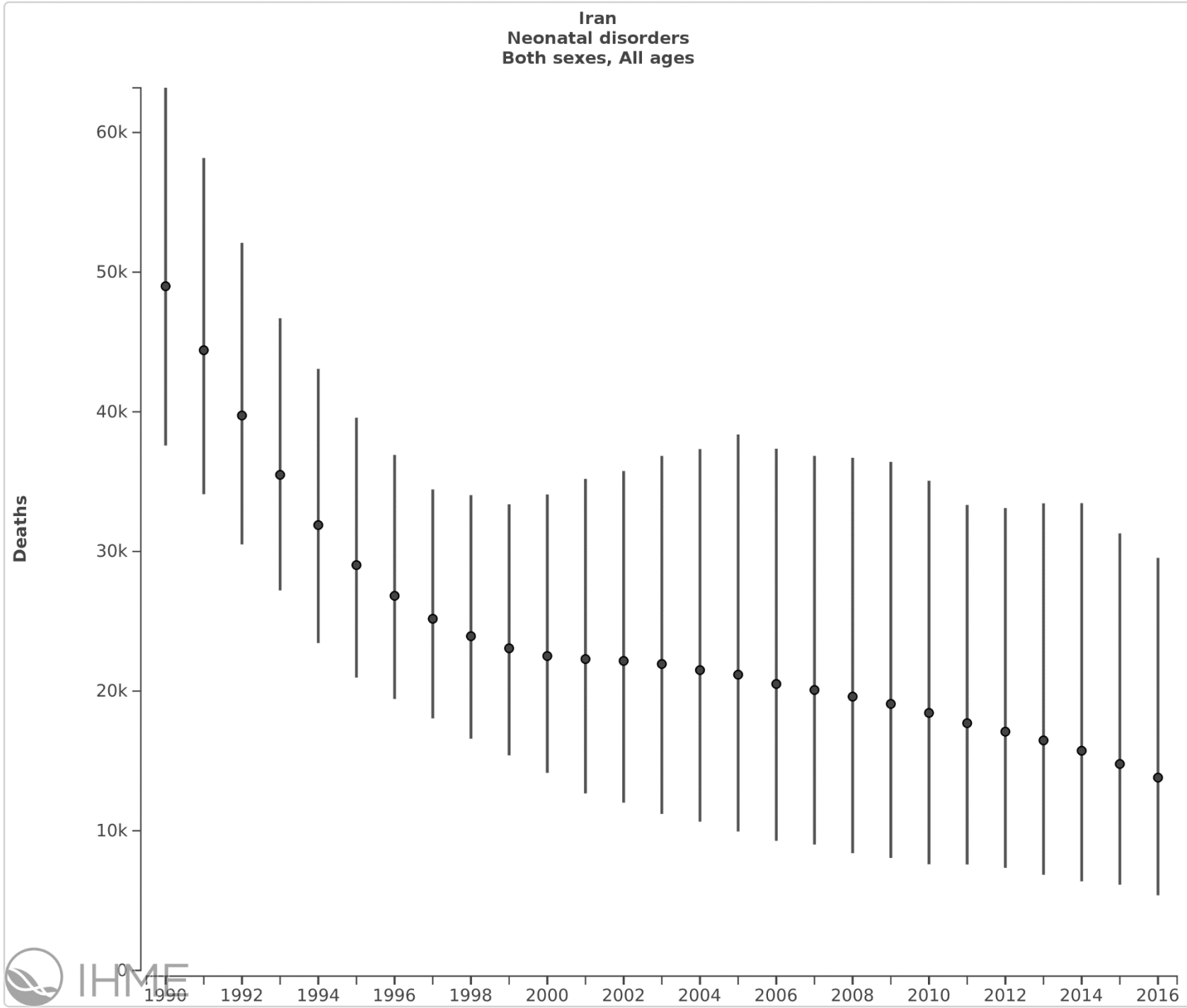
Mortality Rates by Cause

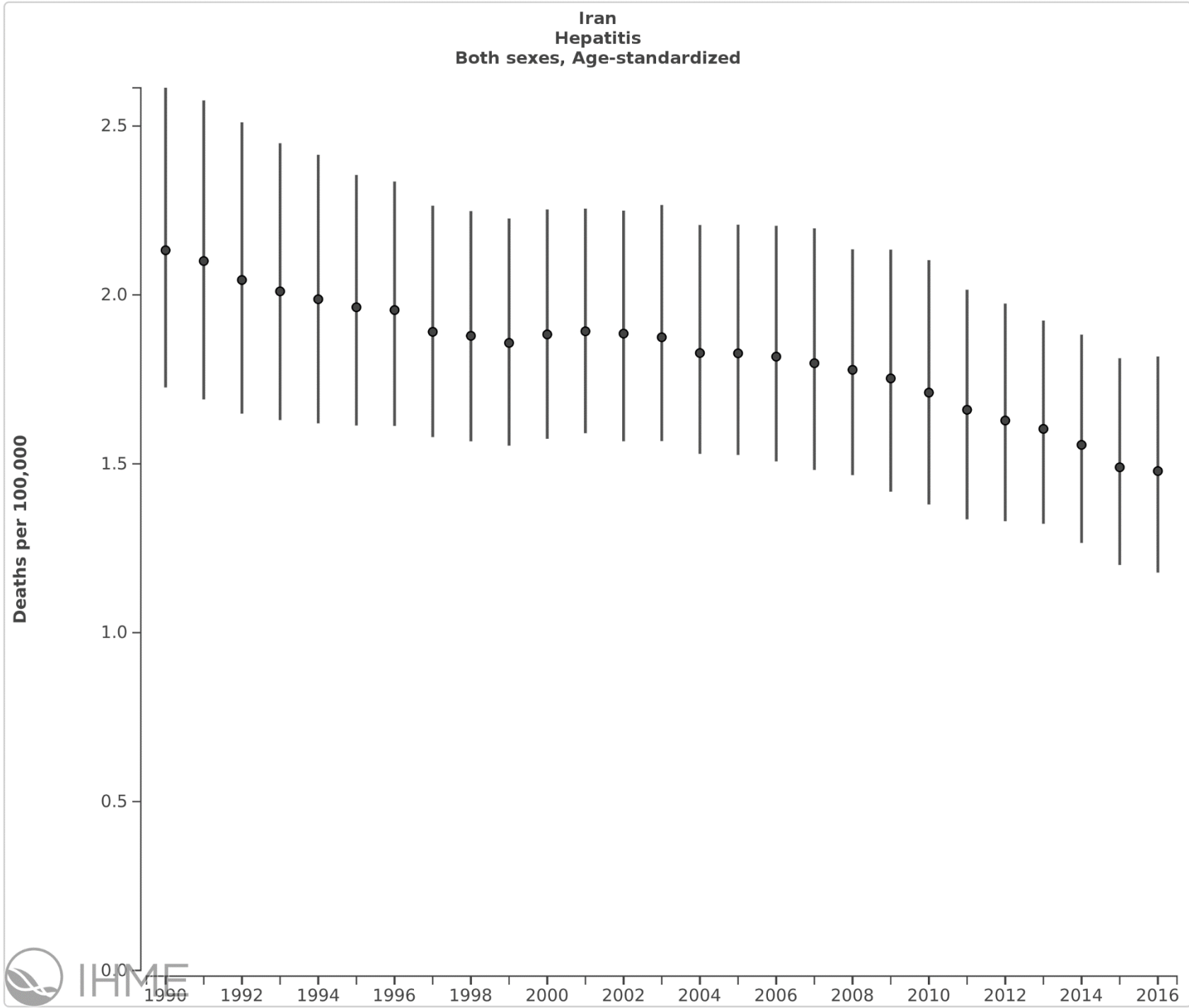
Age Standardized Rate per 100,000 (% of all age deaths)	1990		2016	
	Men	Women	Men	Women
Cardiovascular	498 (23%)	401 (24%)	389 (40%)	314 (44%)
Cerebrovascular	101 (4%)	87 (5%)	72 (7%)	62 (9%)
Road Injuries	90 (10%)	29 (6%)	53 (9%)	16 (4%)
Hypertensive Heart Disease	38 (2%)	42 (2%)	42 (4%)	44 (6%)
Alzheimer's Disease	45 (1.5%)	47 (2%)	46 (4%)	50 (6%)
Diabetes	15 (0.7%)	14 (1%)	29 (3%)	32 (5%)
COPD	29 (1%)	17 (1%)	28 (2.8%)	17 (2.5%)
CKD	25 (1.3%)	17 (1.3%)	24 (2.5%)	18 (2.7%)
Other cardiovascular	39 (2.4%)	37 (2.9%)	21 (2.3%)	19 (2.9%)
Stomach cancer	33 (1.7%)	16 (1.1%)	25 (2.8%)	12 (2%)


Iran
Communicable, maternal, neonatal, and nutritional diseases
Both sexes, All ages
Deaths
100k
80k
60k
40k
20k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

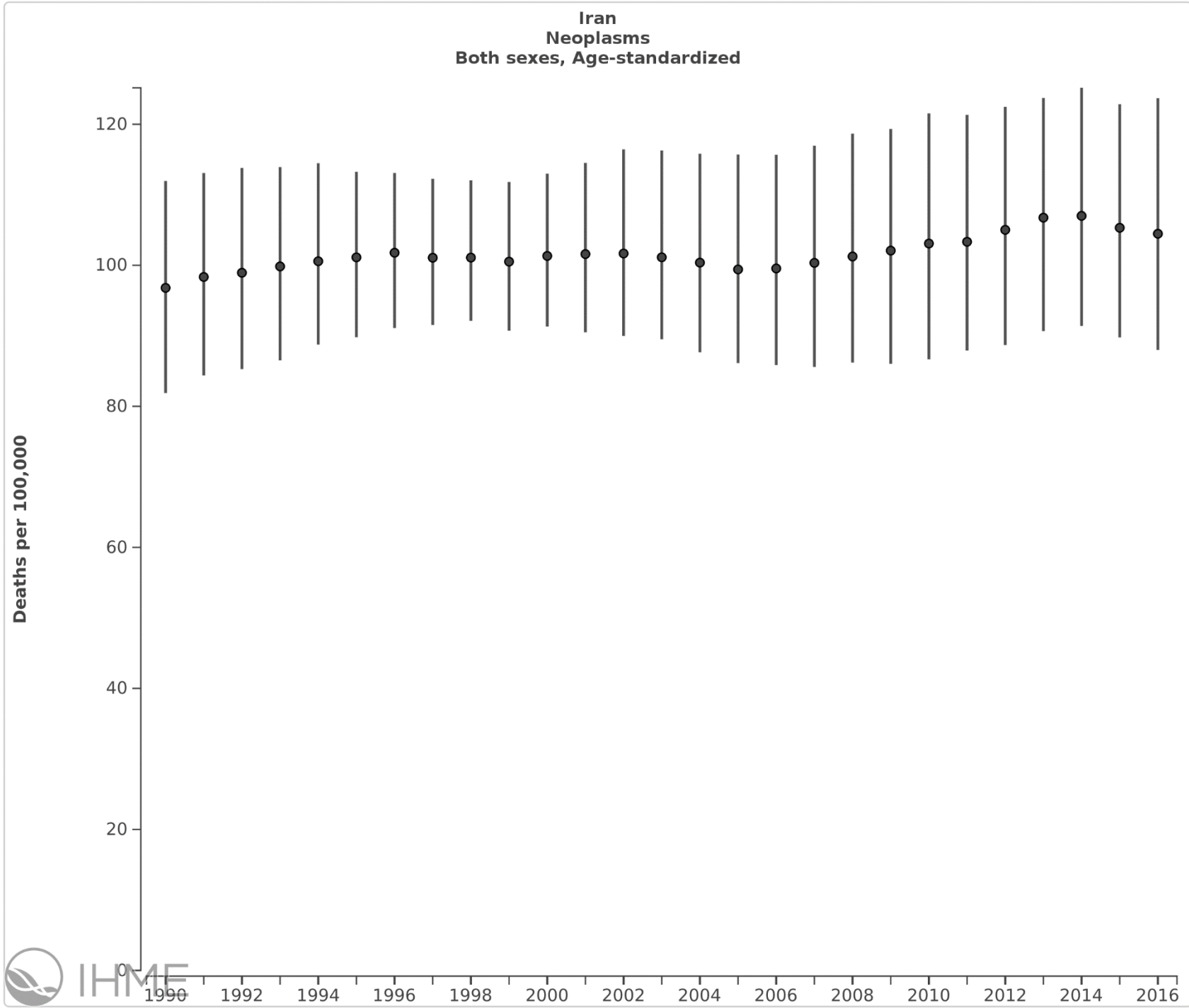

Iran
Diarrheal diseases
Both sexes, All ages
Deaths
15k
10k
5k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

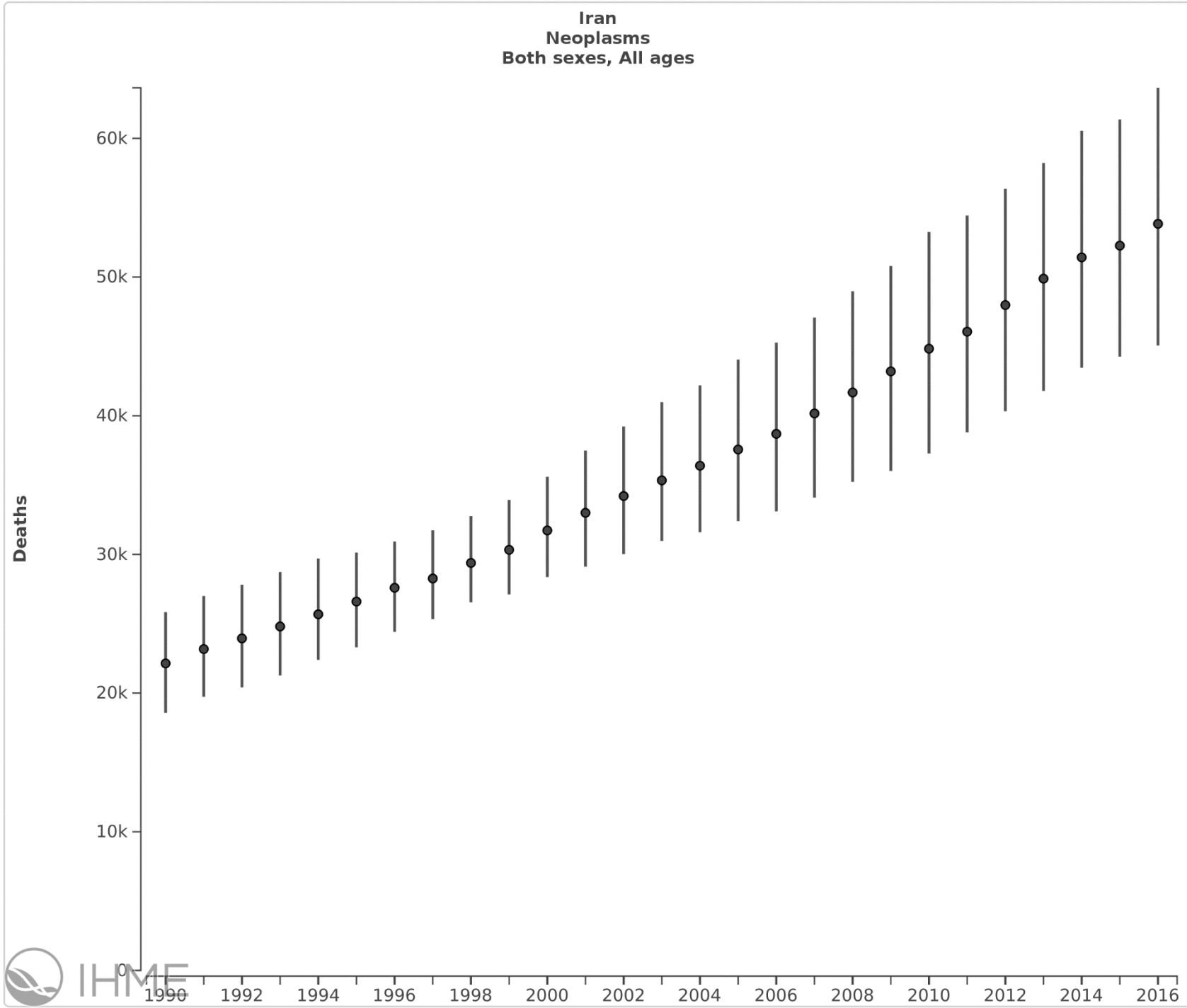

Iran
Maternal disorders
Females, All ages
Deaths
1k
800
600
400
200
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

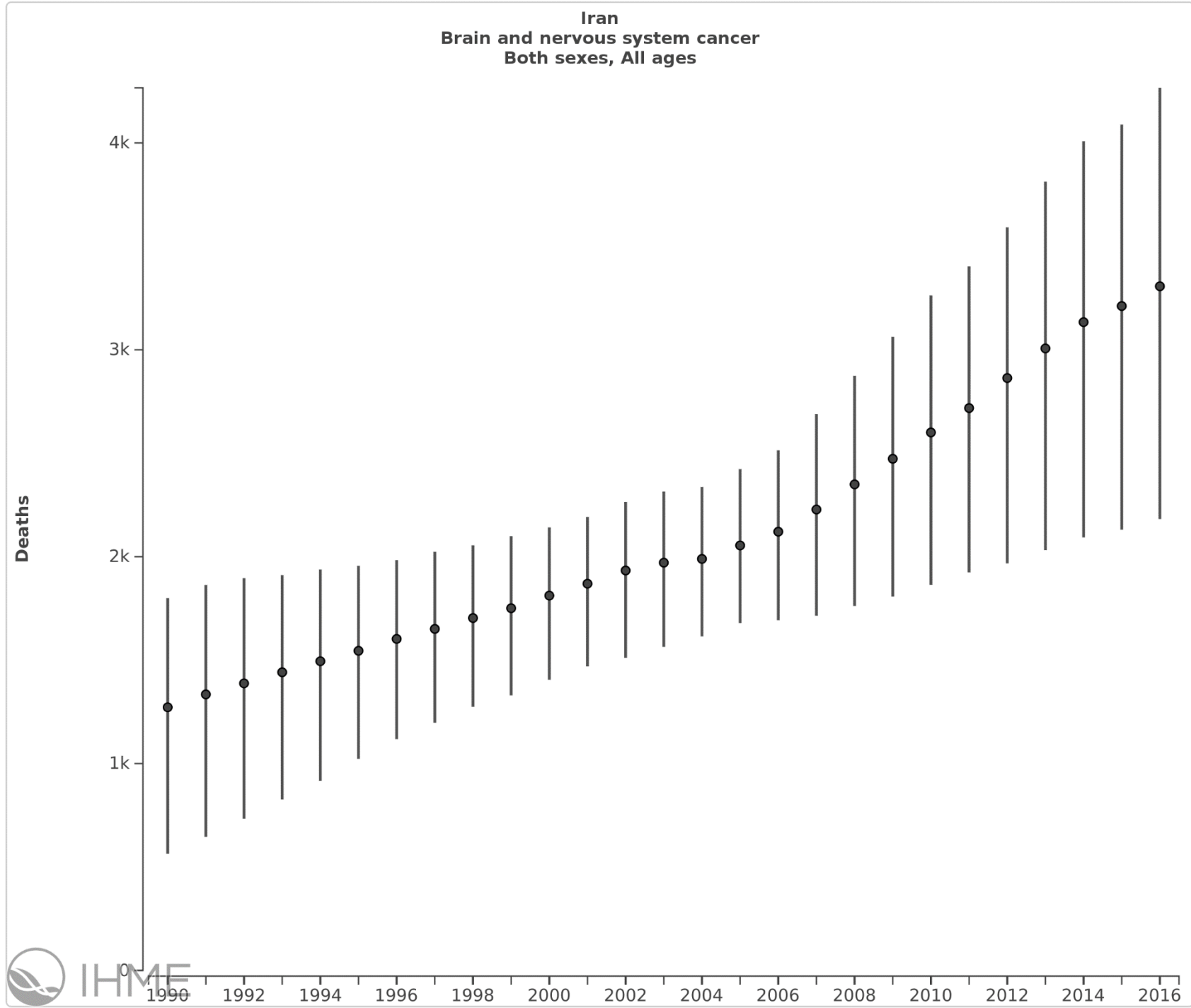

Iran
Neonatal disorders
Both sexes, All ages
Deaths
60k
50k
40k
30k
20k
10k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME


Iran
Hepatitis
Both sexes, Age-standardized
Deaths per 100,000
2.5
2.0
1.5
1.0
0.5
0.0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

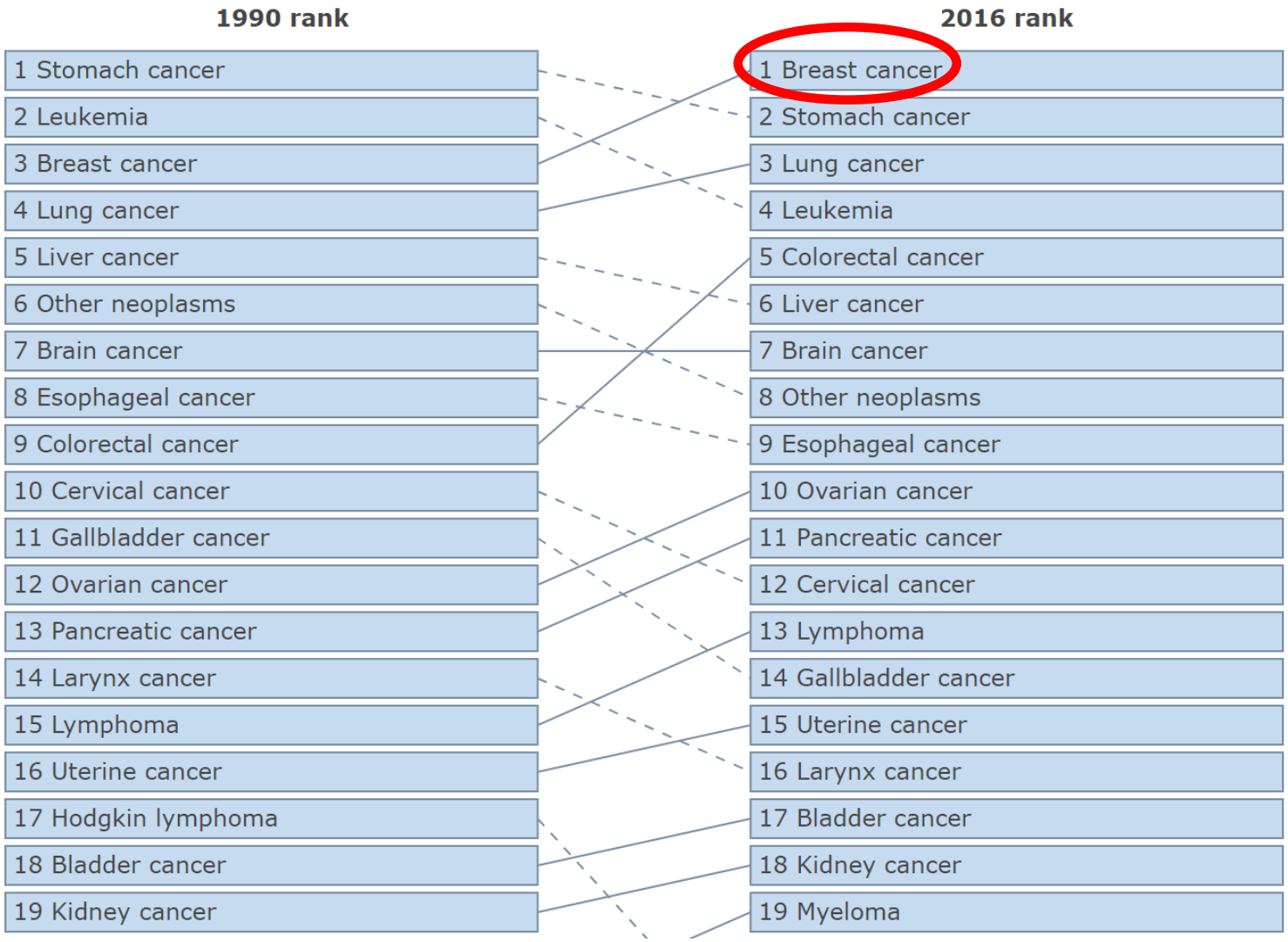
Neoplasms


Iran
Neoplasms
Both sexes, Age-standardized
Deaths per 100,000
120
100
80
60
40
20
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

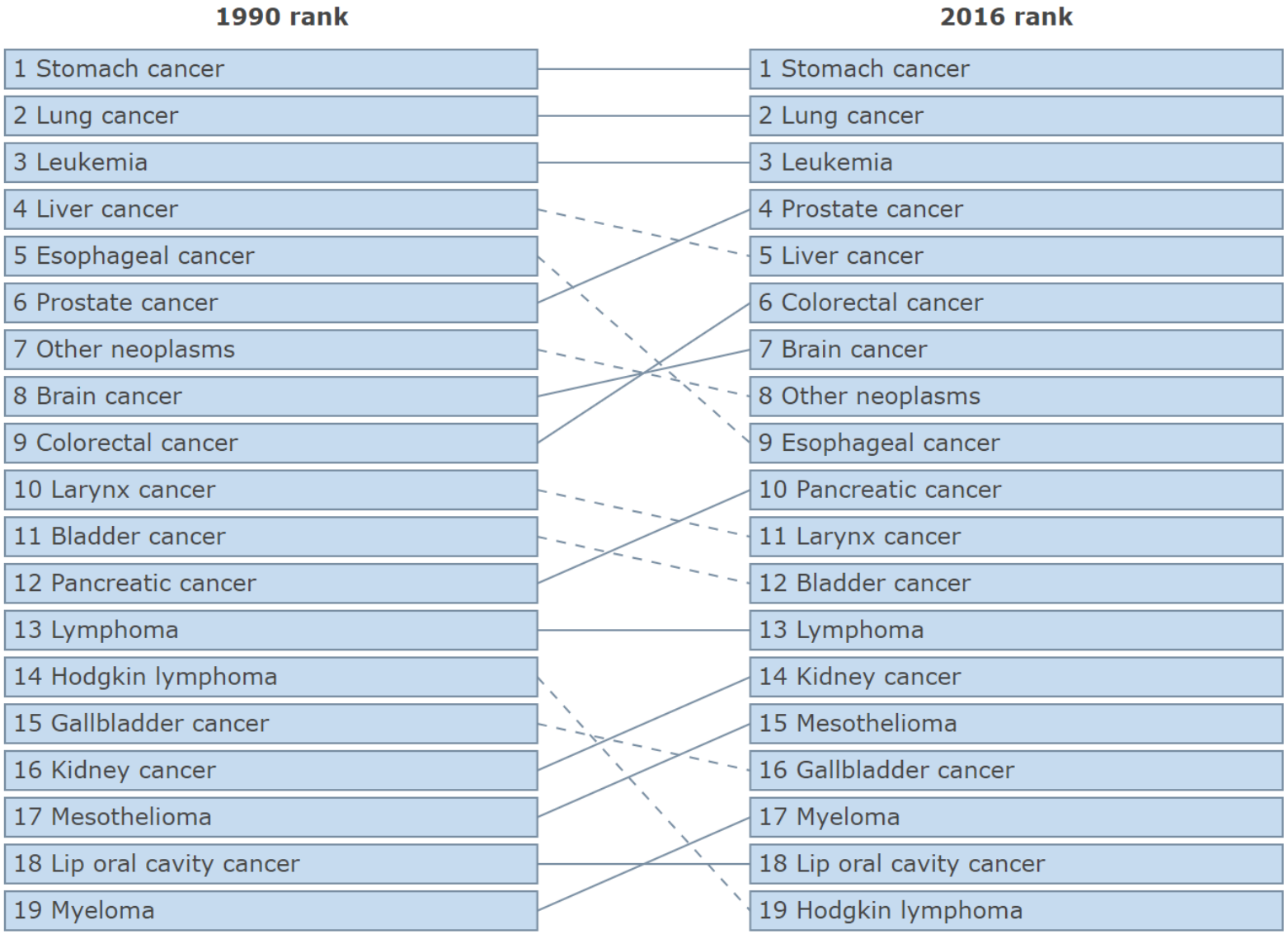

Iran
Neoplasms
Both sexes, All ages
Deaths
60k
50k
40k
30k
20k
10k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME


Iran
Brain and nervous system cancer
Both sexes, All ages
Deaths
4k
3k
2k
1k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME

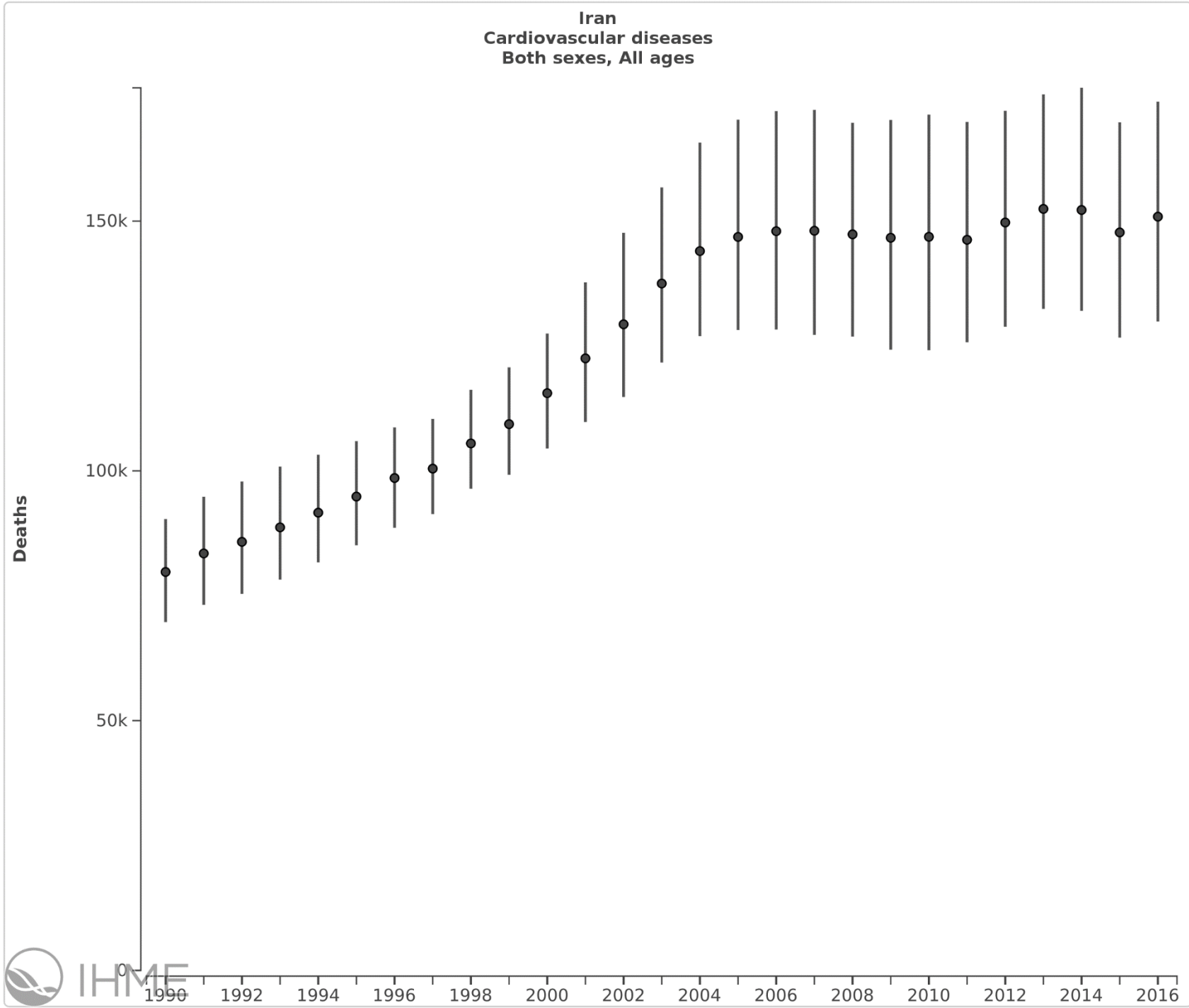
Neoplasms in Women, Percent of Total Deaths

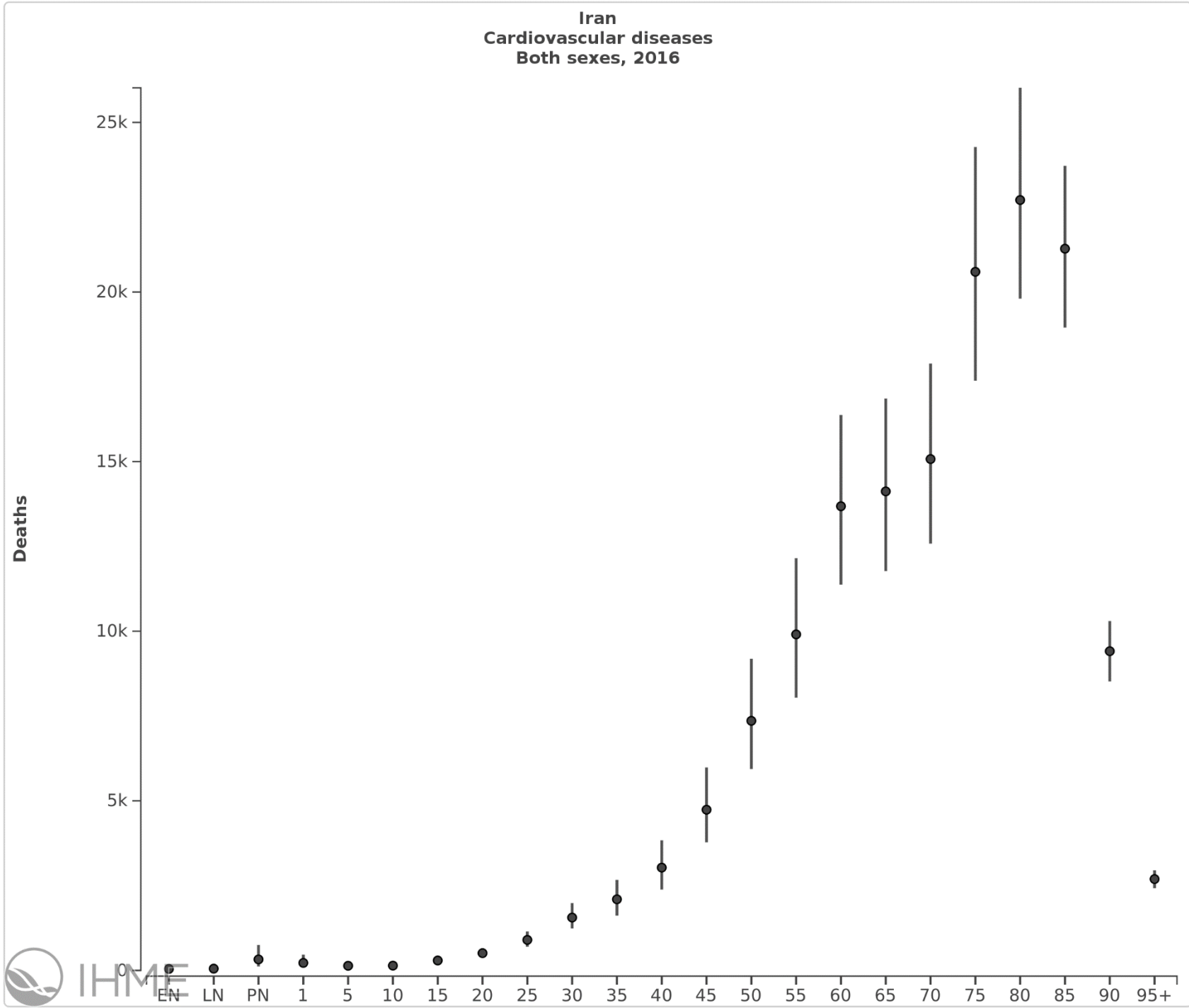


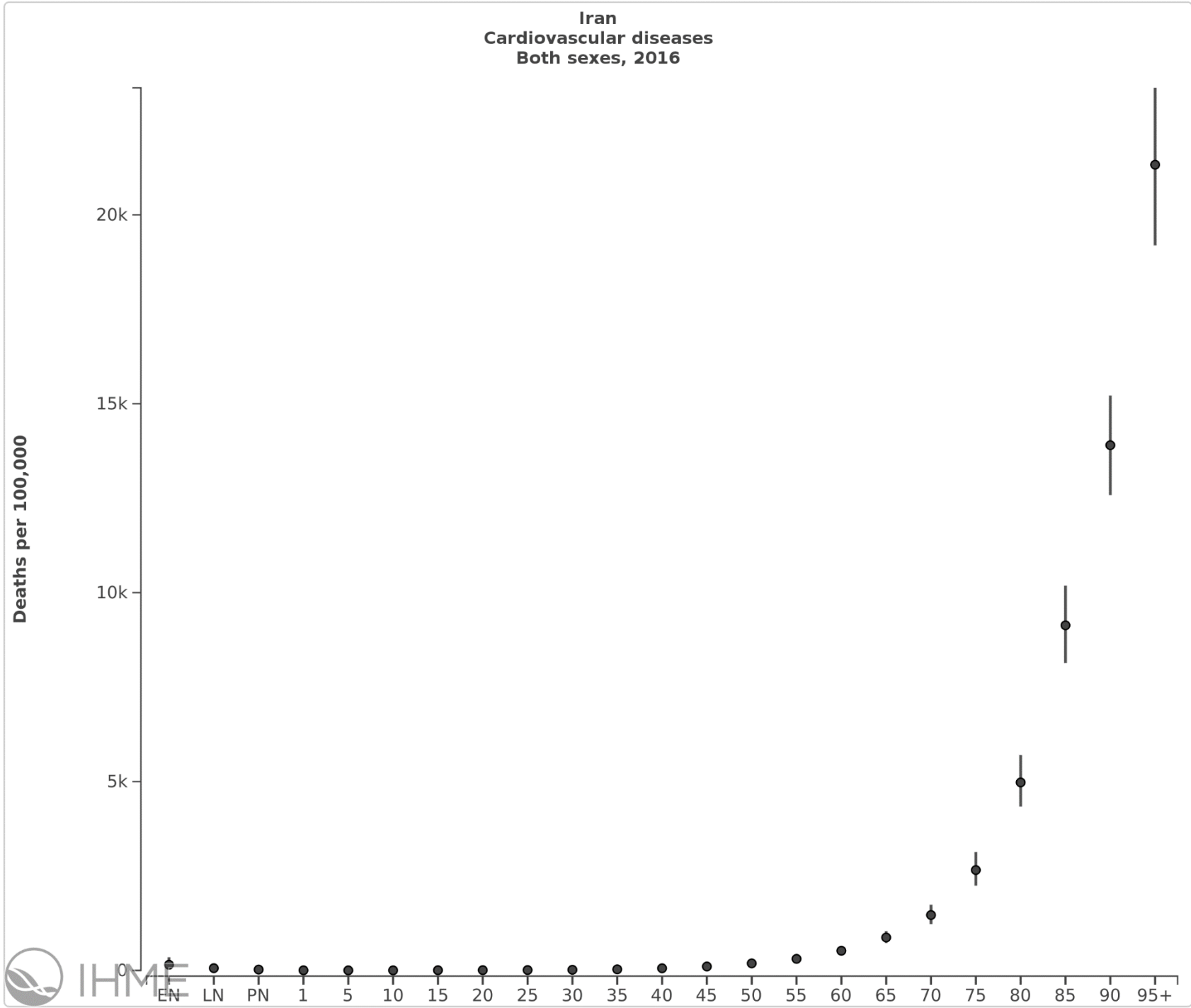
Neoplasms in Men, Percent of Total Deaths



Cardiovascular Diseases

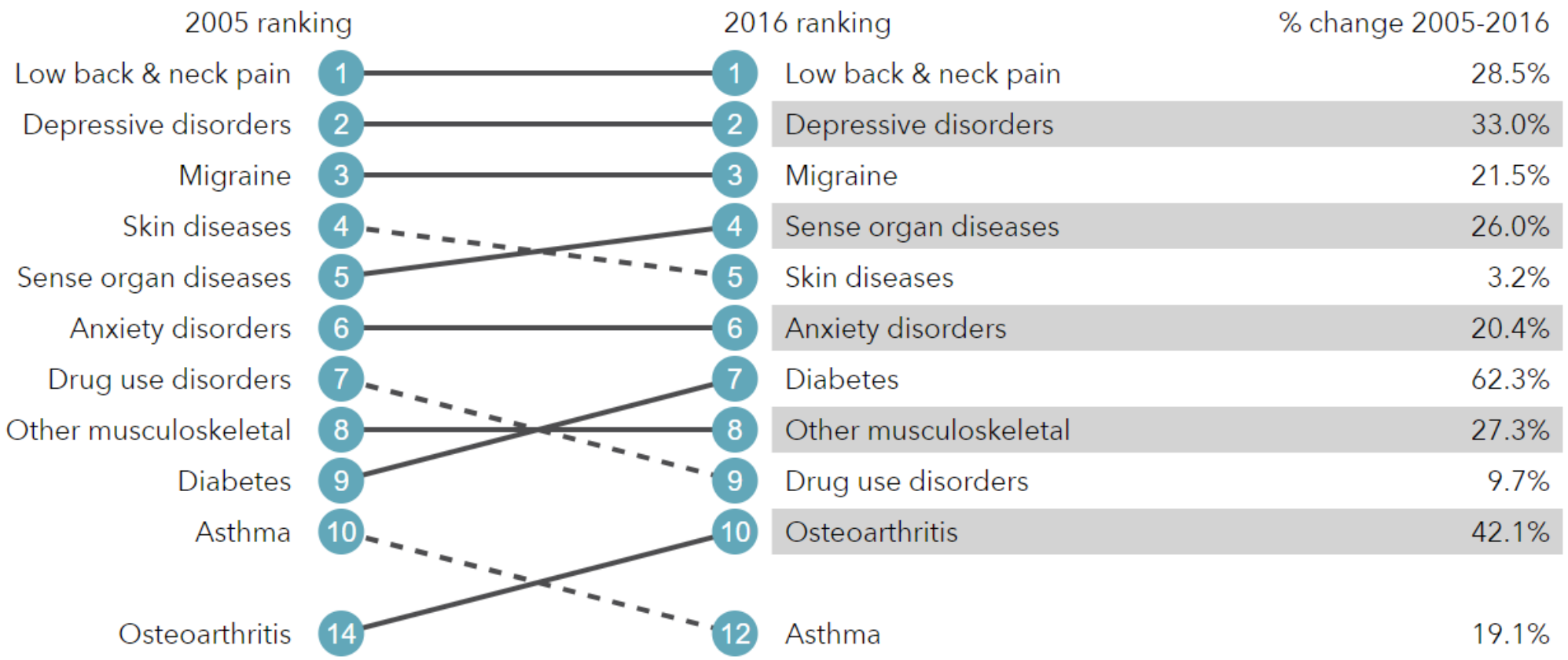

Iran
Cardiovascular diseases
Both sexes, All ages
Deaths
150k
100k
50k
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
IHME


Iran
Cardiovascular diseases
Both sexes, 2016
Deaths
25k
20k
15k
10k
5k
0
EN
LN
PN
1
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95+
IHME


Iran
Cardiovascular diseases
Both sexes, 2016
Deaths per 100,000
20k
15k
10k
5k
0
EN
LN
PN
1
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95+
IHME

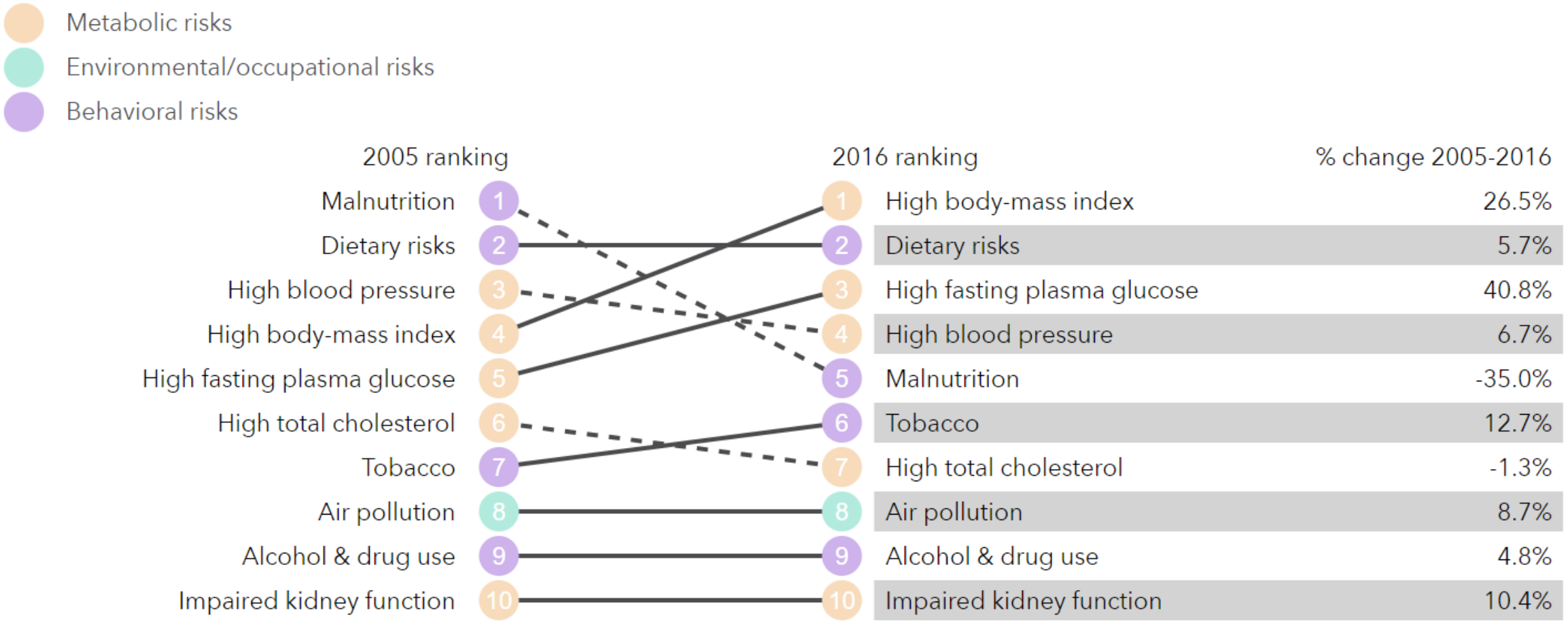
Disability

Top 10 Causes of Disability

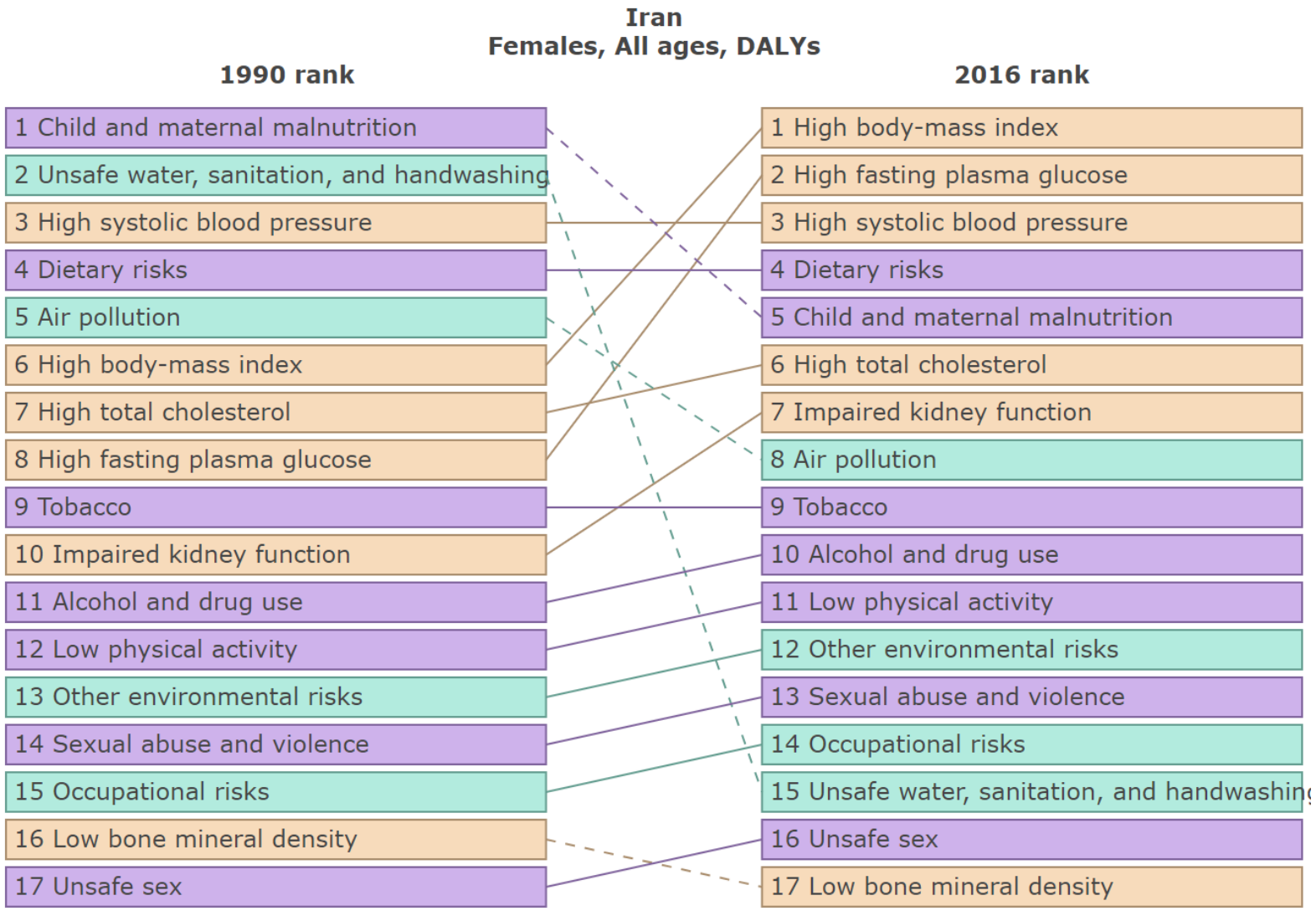


Risk Factors

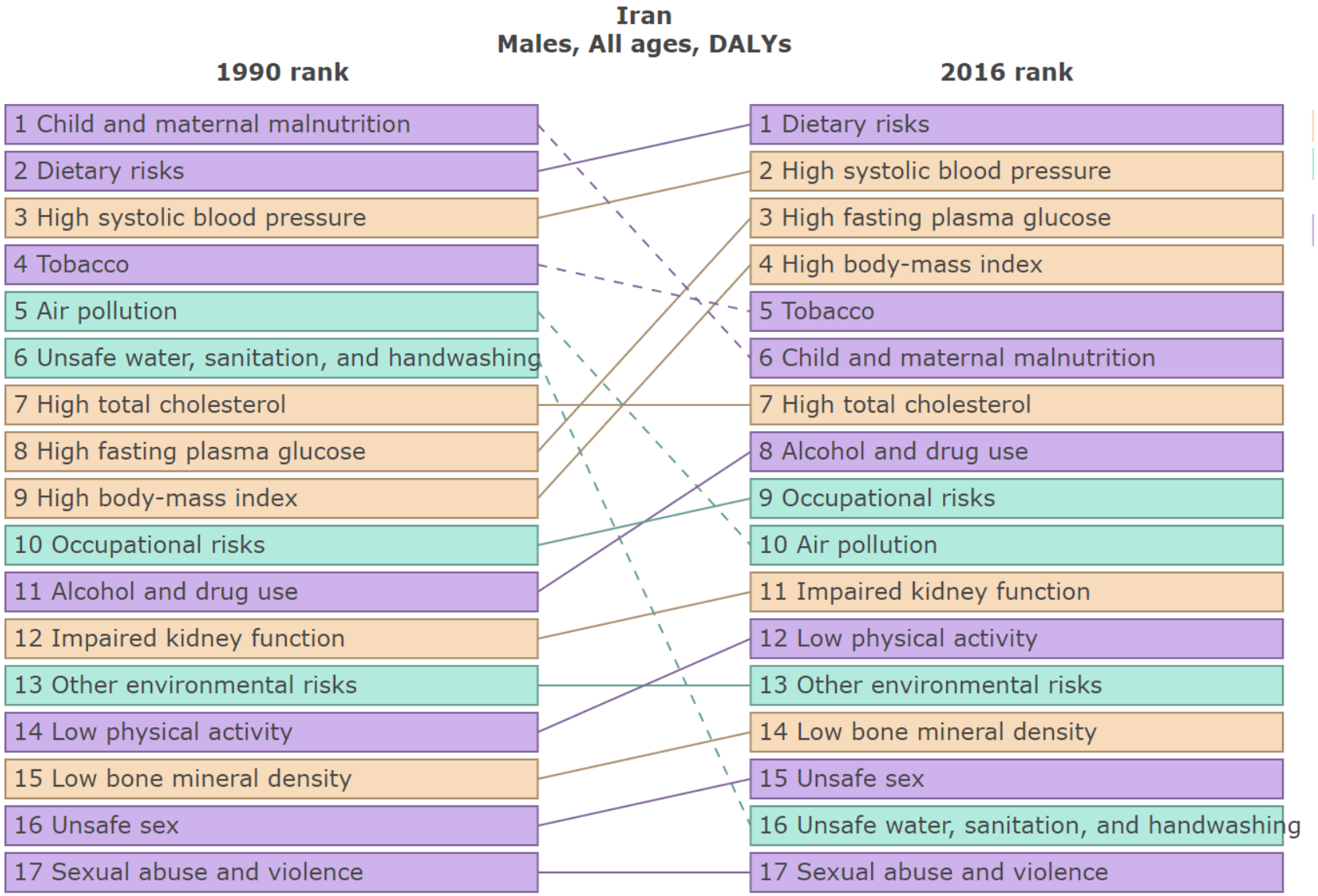
Most Important Risk Factors in both sexes in Iran



Main Risk Factors in Women in Iran



Main Risk Factors in Men in Iran



Primary Results of STEPs 2016

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Associate professor in Global Health and Population

Chair of Non-Communicable Diseases Research Center

Endocrinology and Metabolism Research Institute

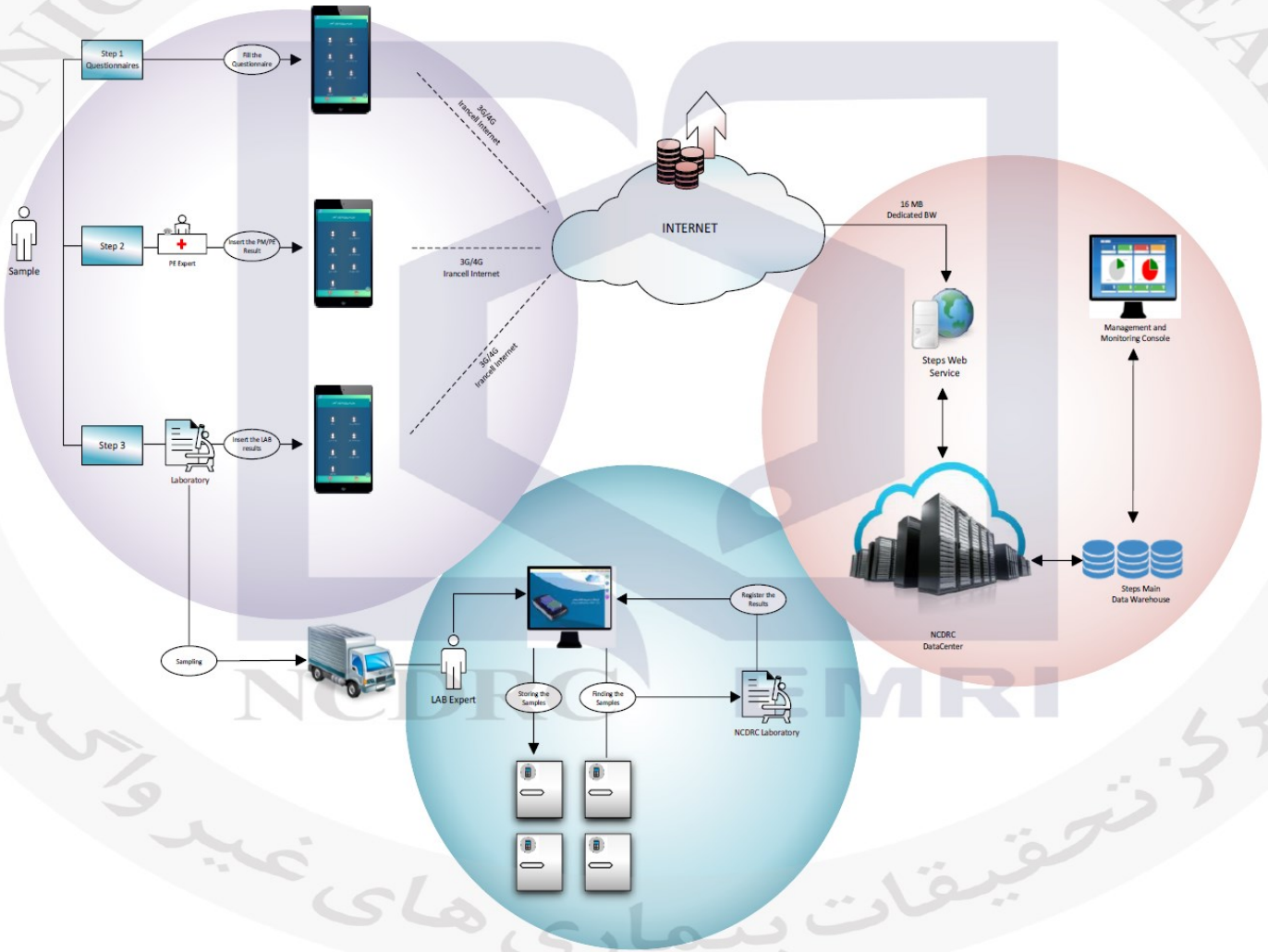
Tehran University of Medical Sciences

February 11, 2017

Steps study of iran in 2016

- The WHO STEPwise approach to Surveillance (STEPS) is a simple, standardized method for collecting, analysing and disseminating data in WHO member countries.
- A random sample of 30,000 Iranian (18-70 year of age)selected from rural and urban area was studied using Questioner ,clinical exam and blood sampling during 2016.
- Results are in next slides

Data Gathering and Management

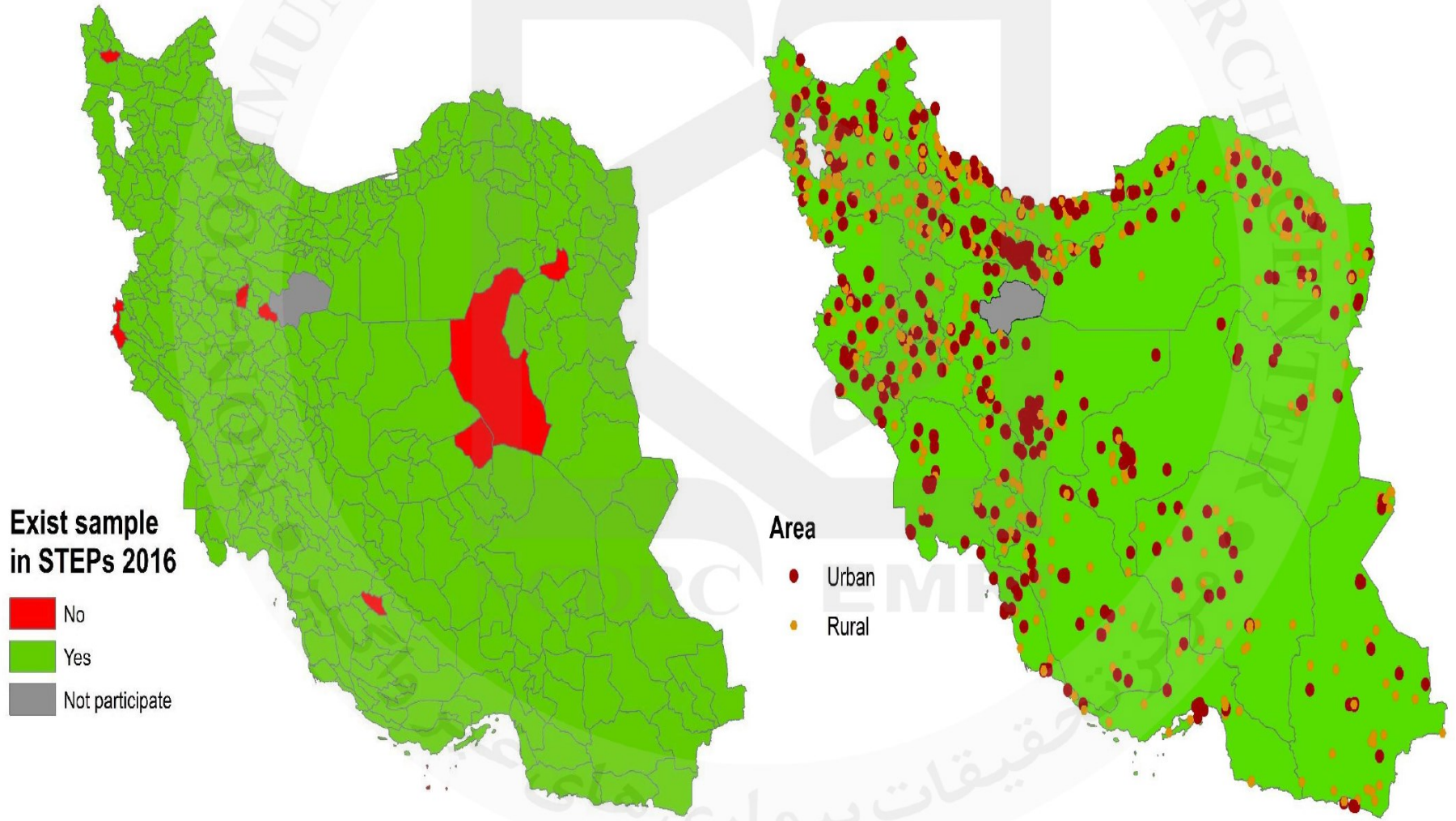


Implementation in Field (Interviewing and Sampling)

Checking Laboratory Samples

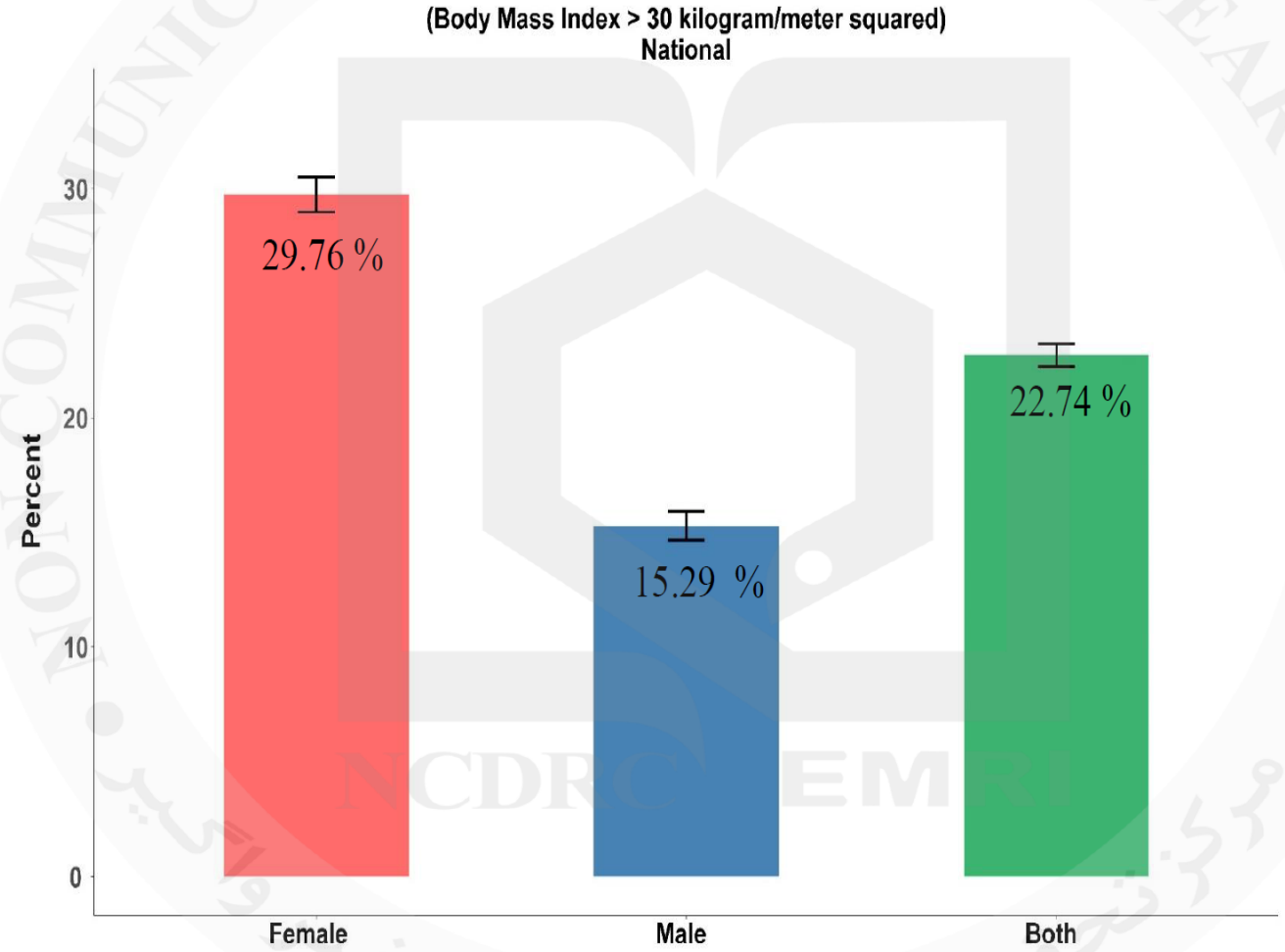
Supervision

Sampling frame and spots

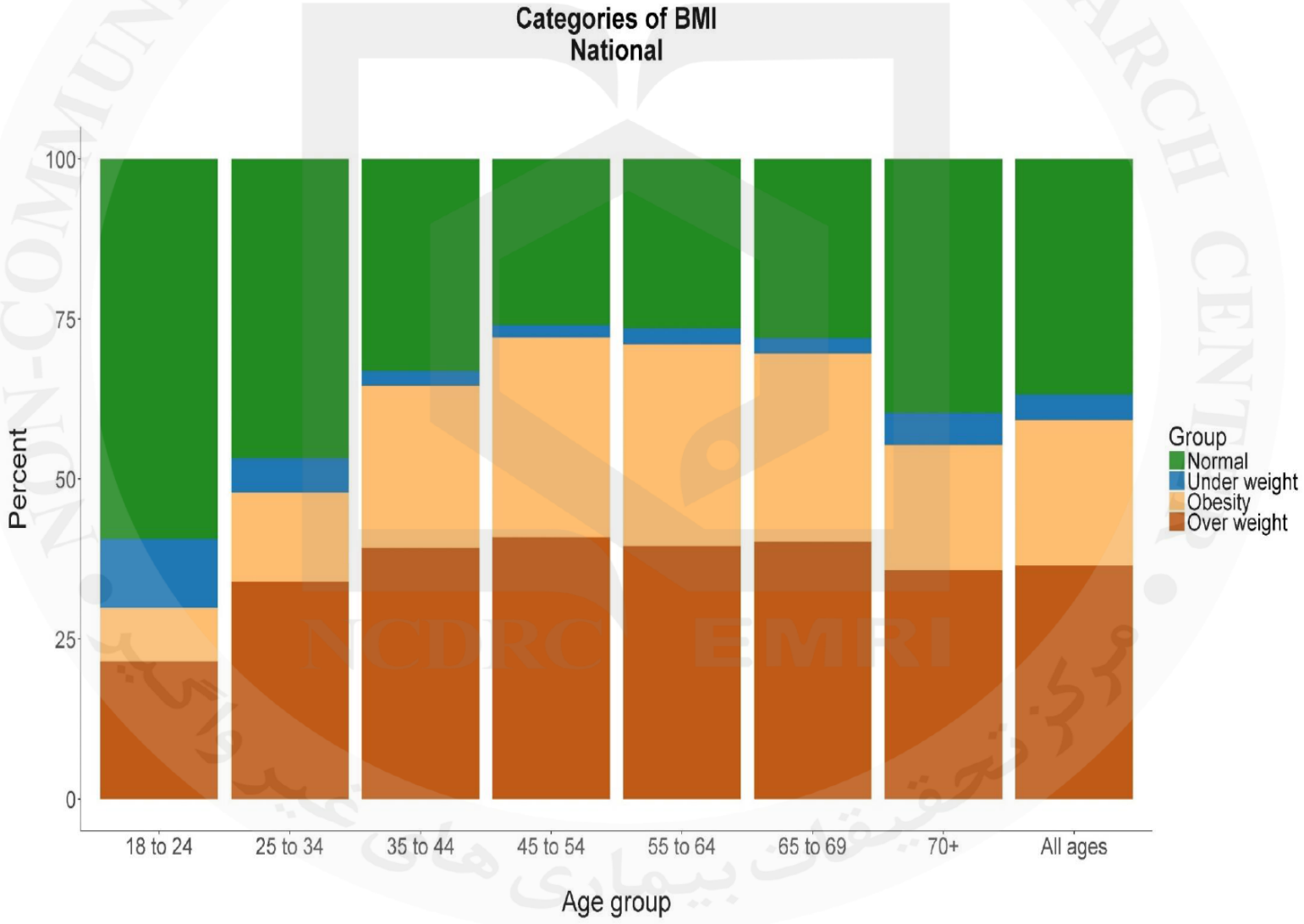


Results

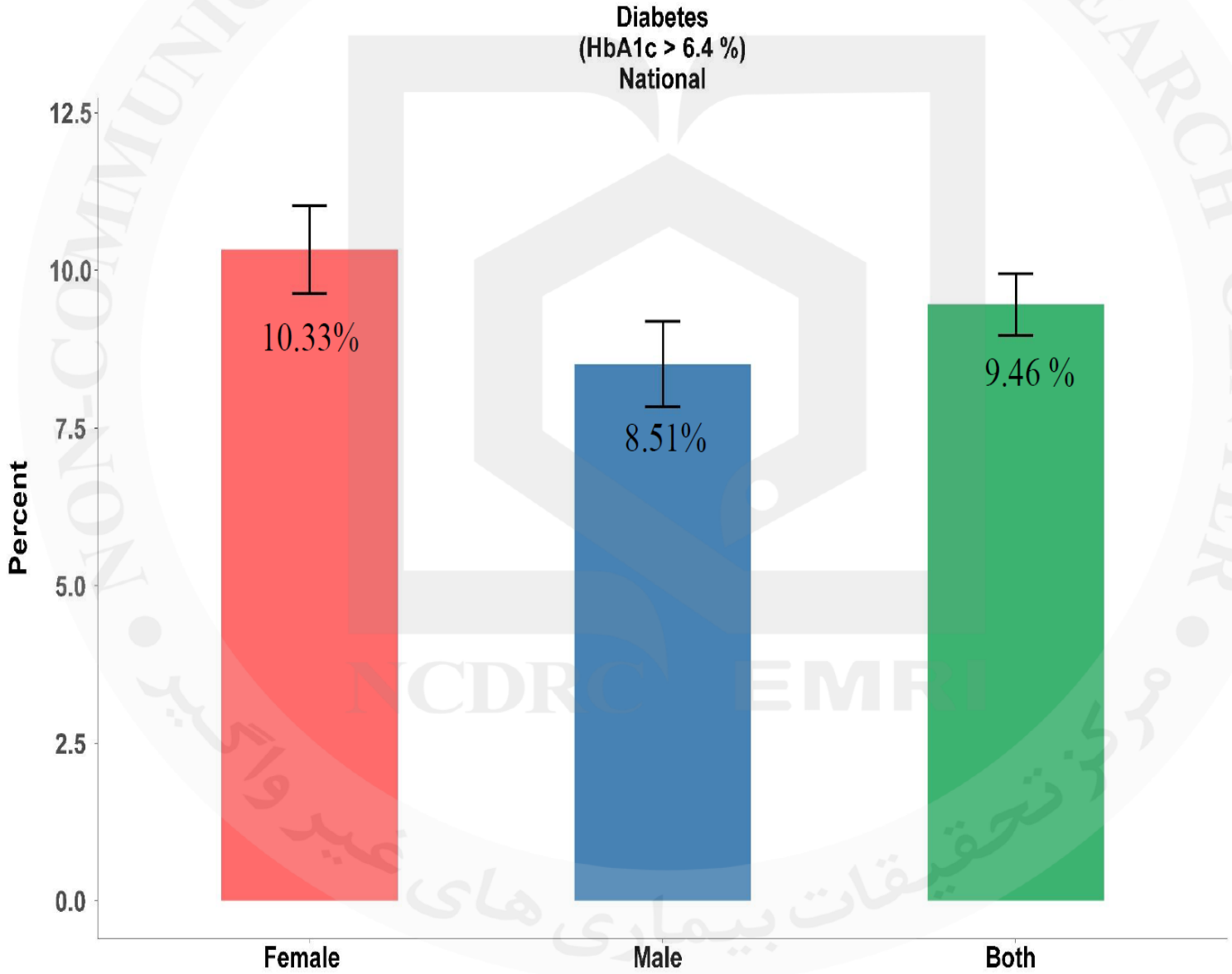
Obesity Prevalence



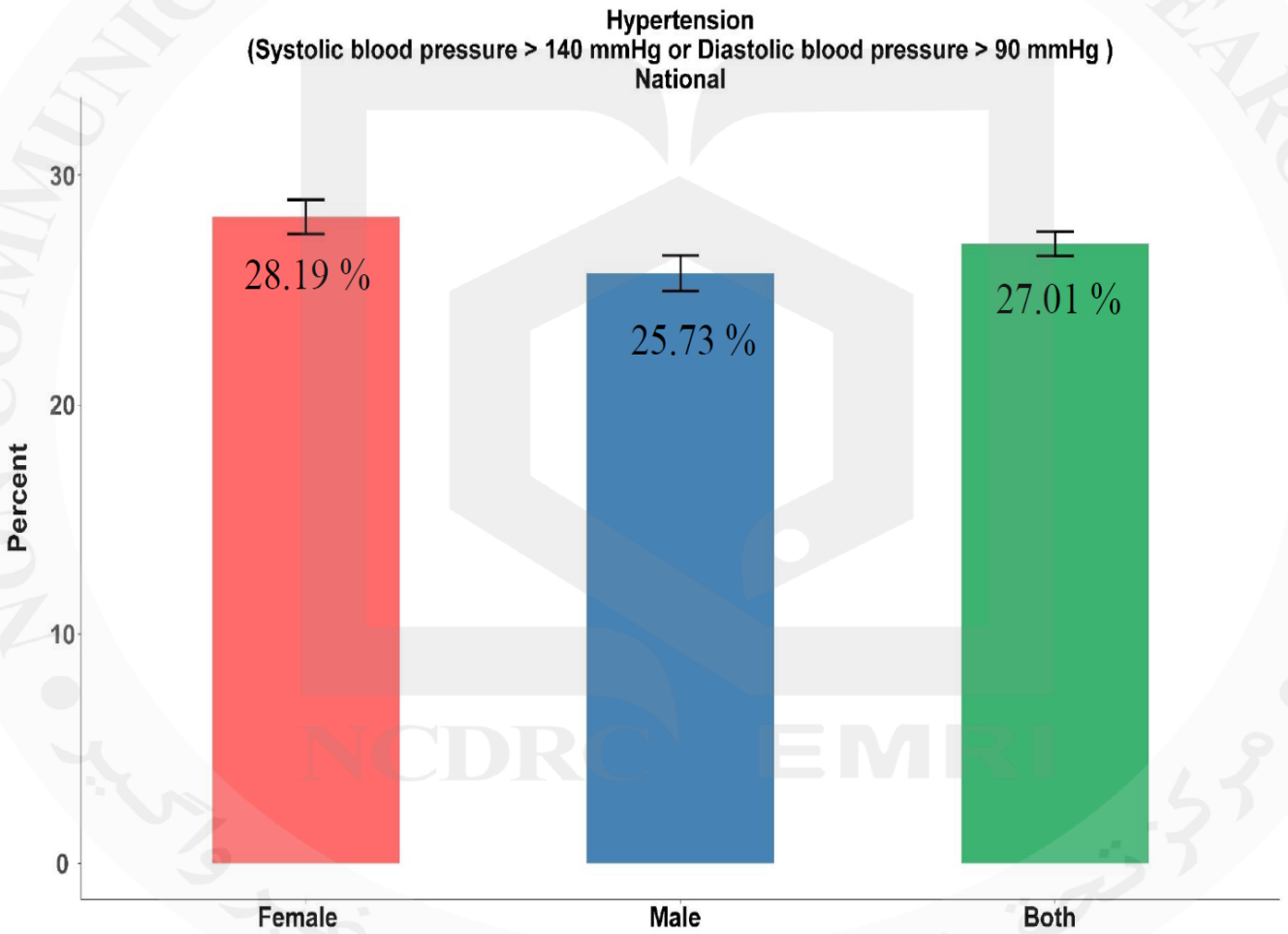
Obesity Prevalence



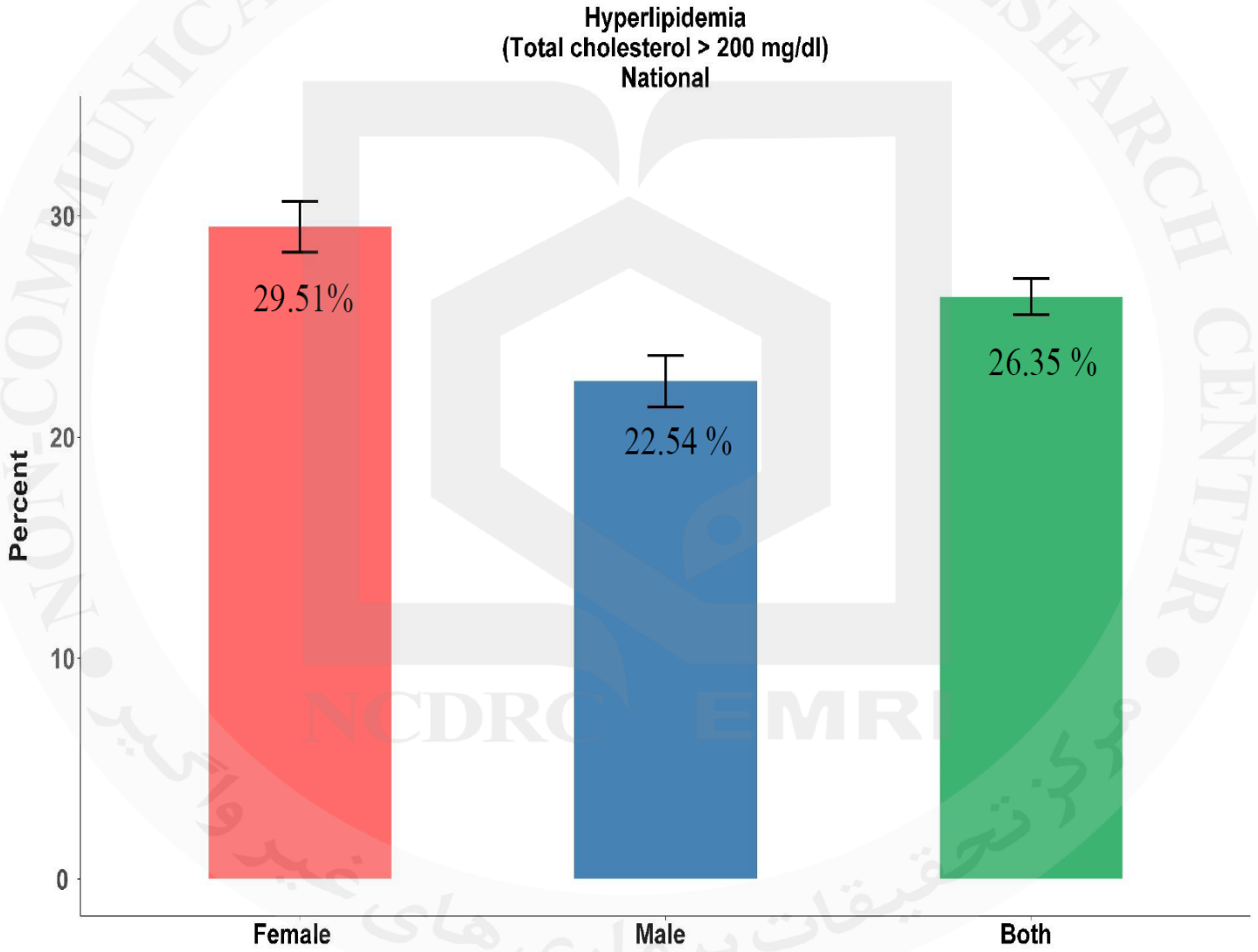
Diabetes Prevalence



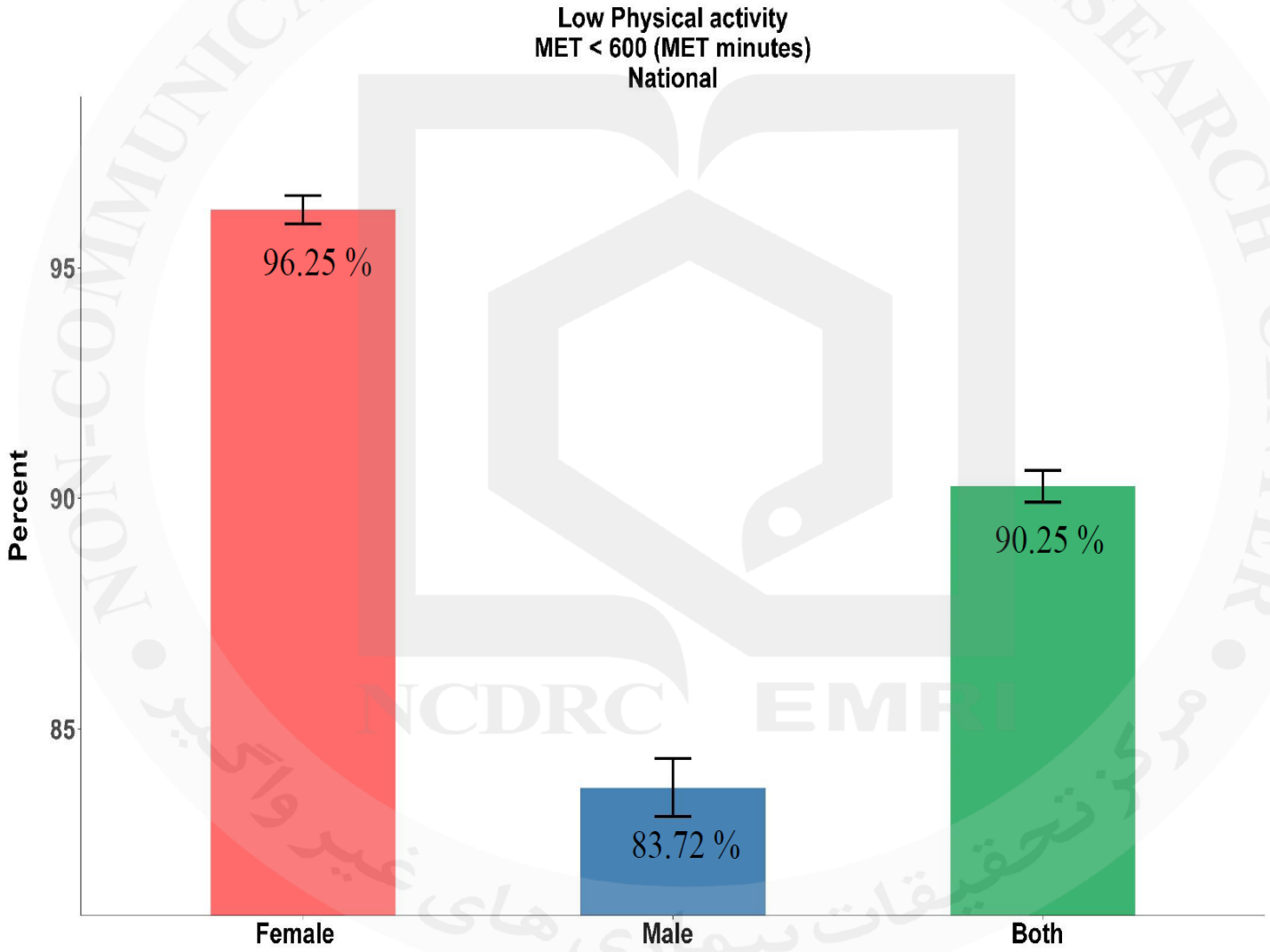
Hypertension



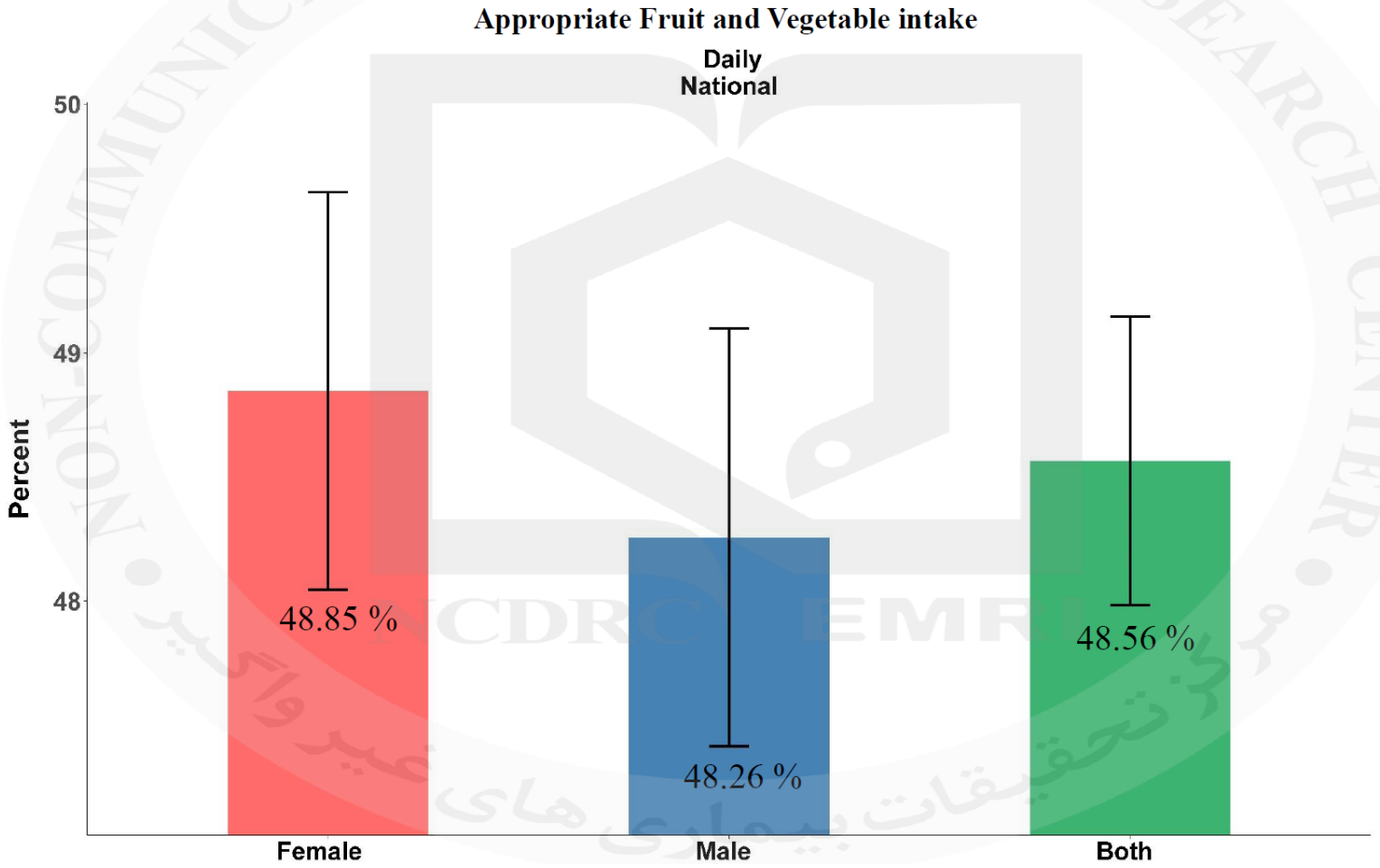
Hyperlipidemia



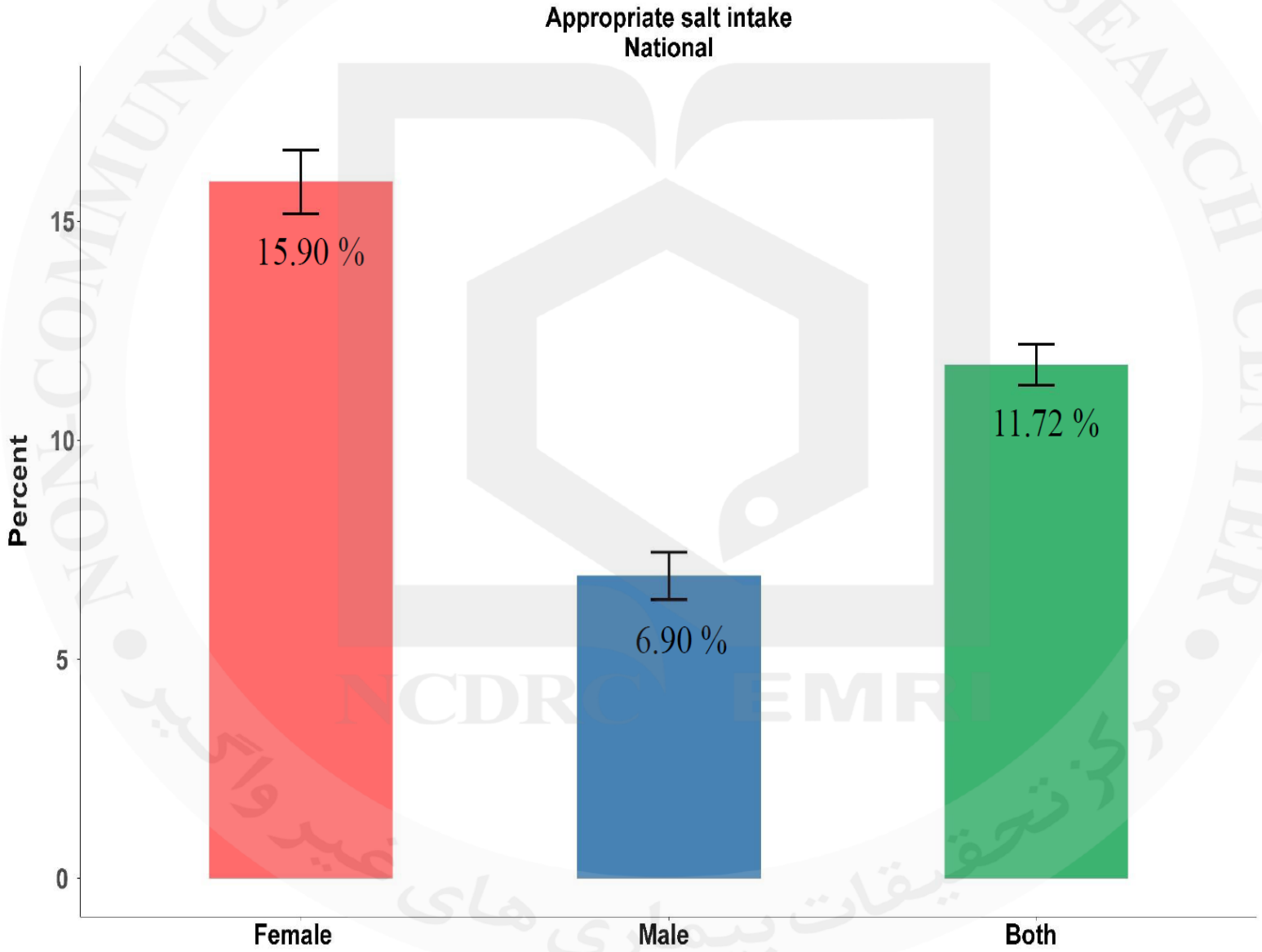
Low Physical Activity



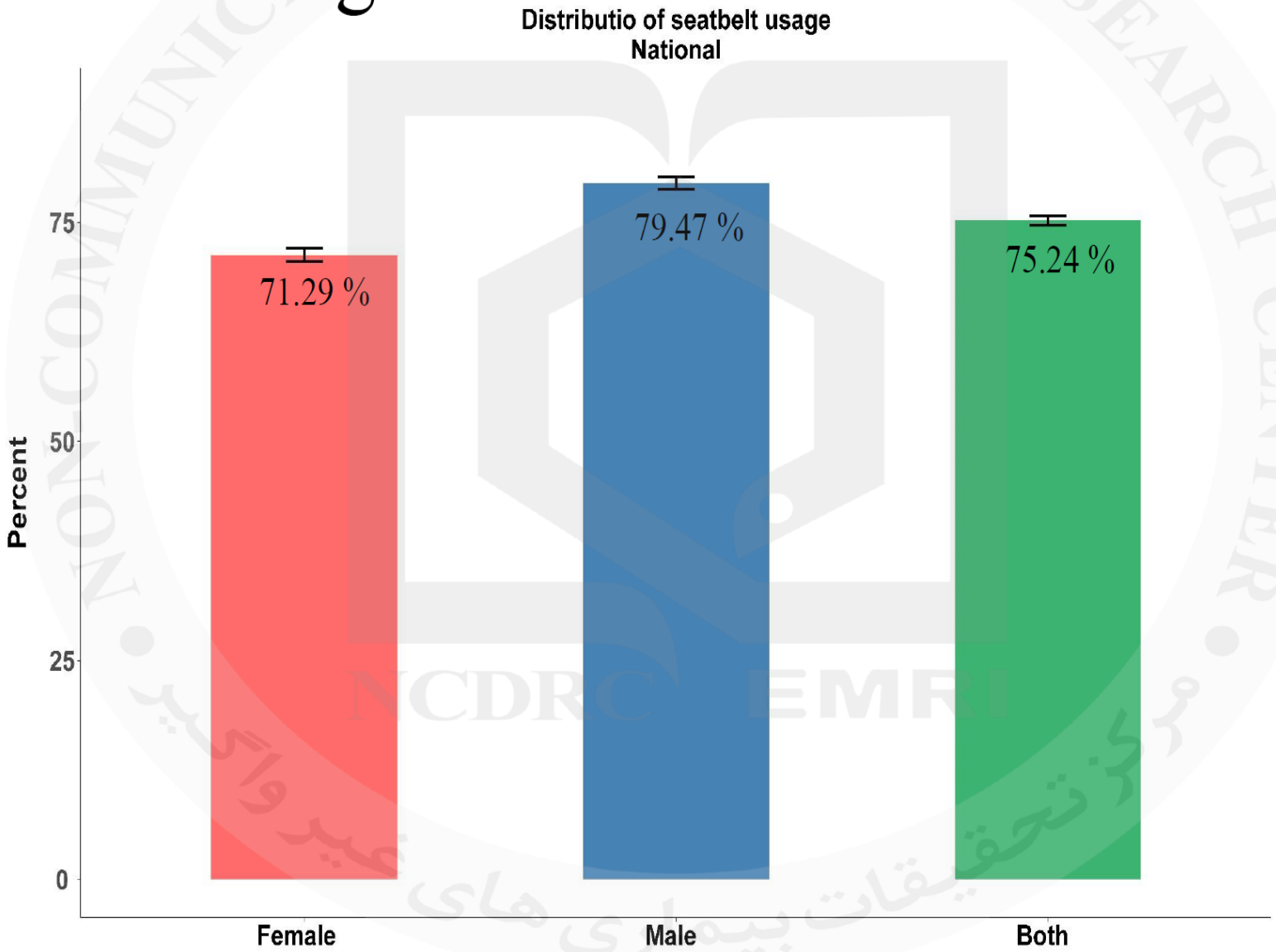
Appropriate Fruit and Vegetable Intake



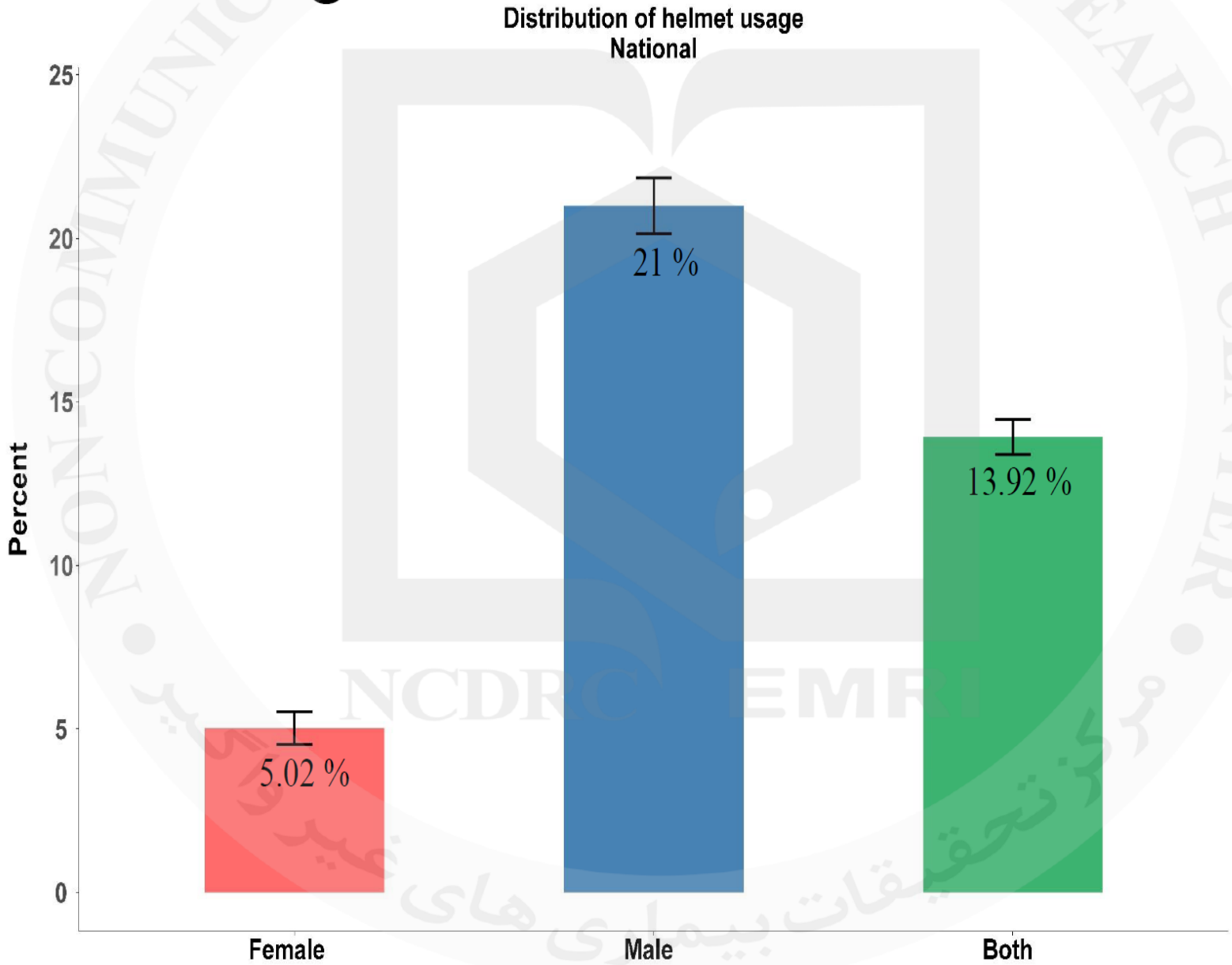
Appropriate Salt Intake



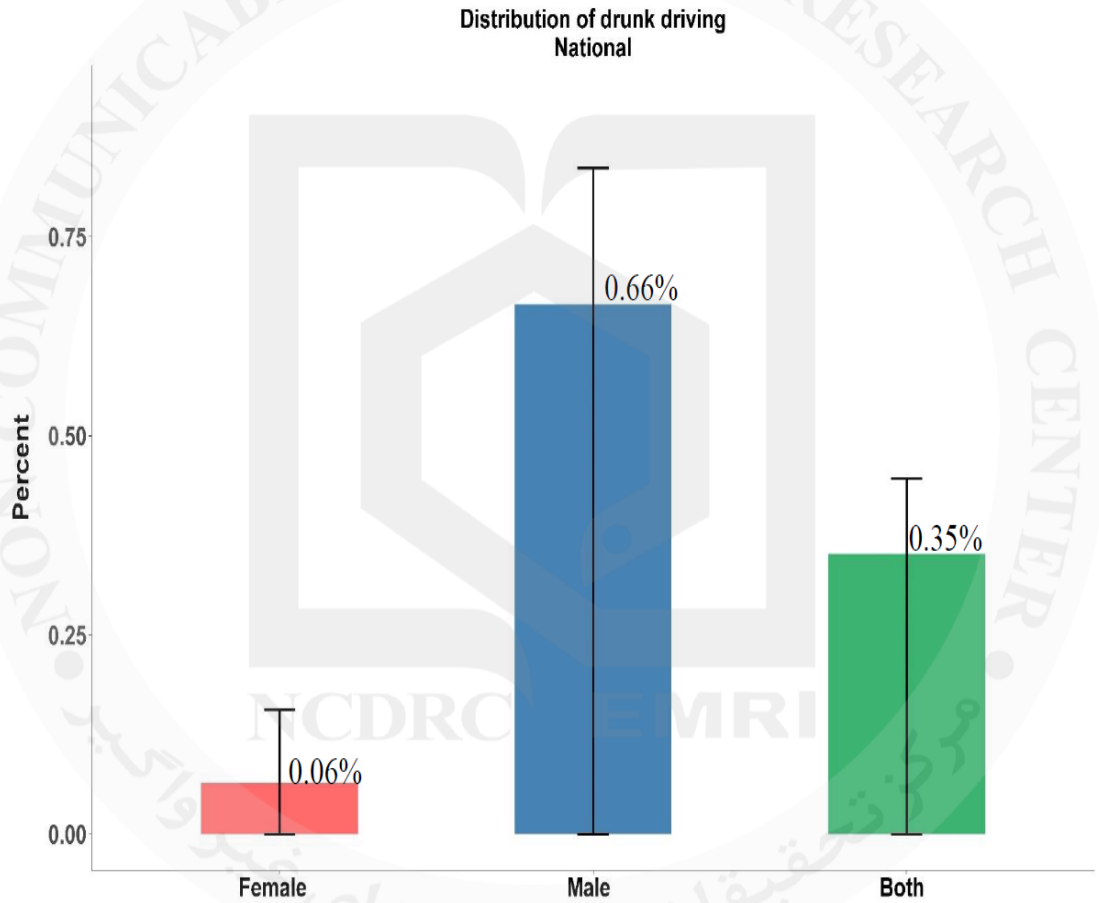
Seatbelt Usage



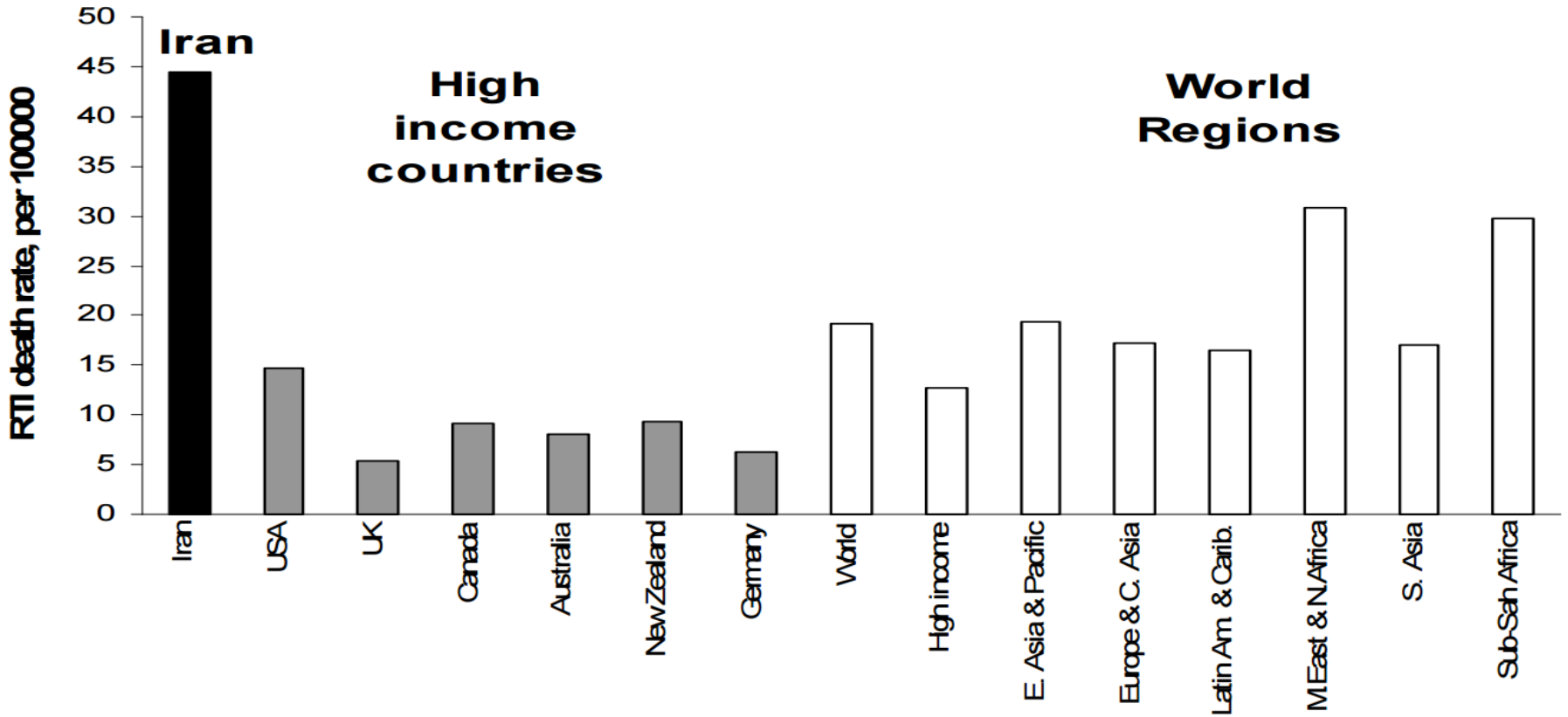
Helmet Usage



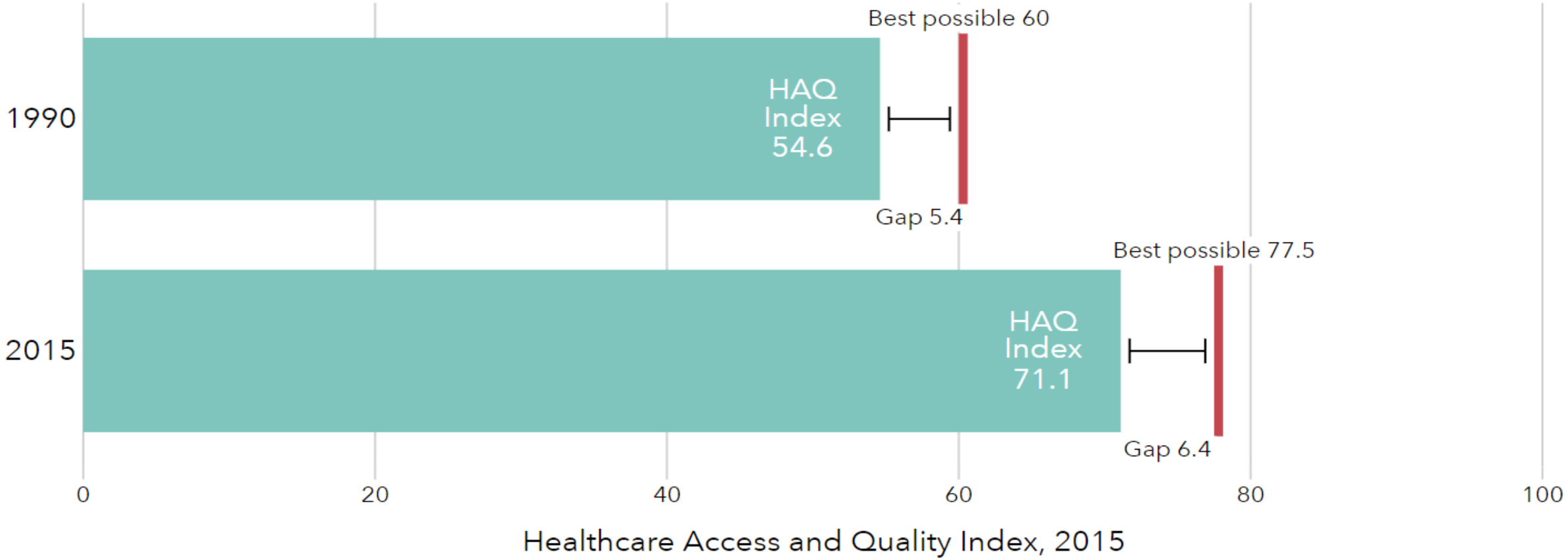
Drunk Driving



Car accident death In Iran



Personal Health Care Access and Quality Index



Health research and Infrastructure for Collaboration

Medical Universities in Iran

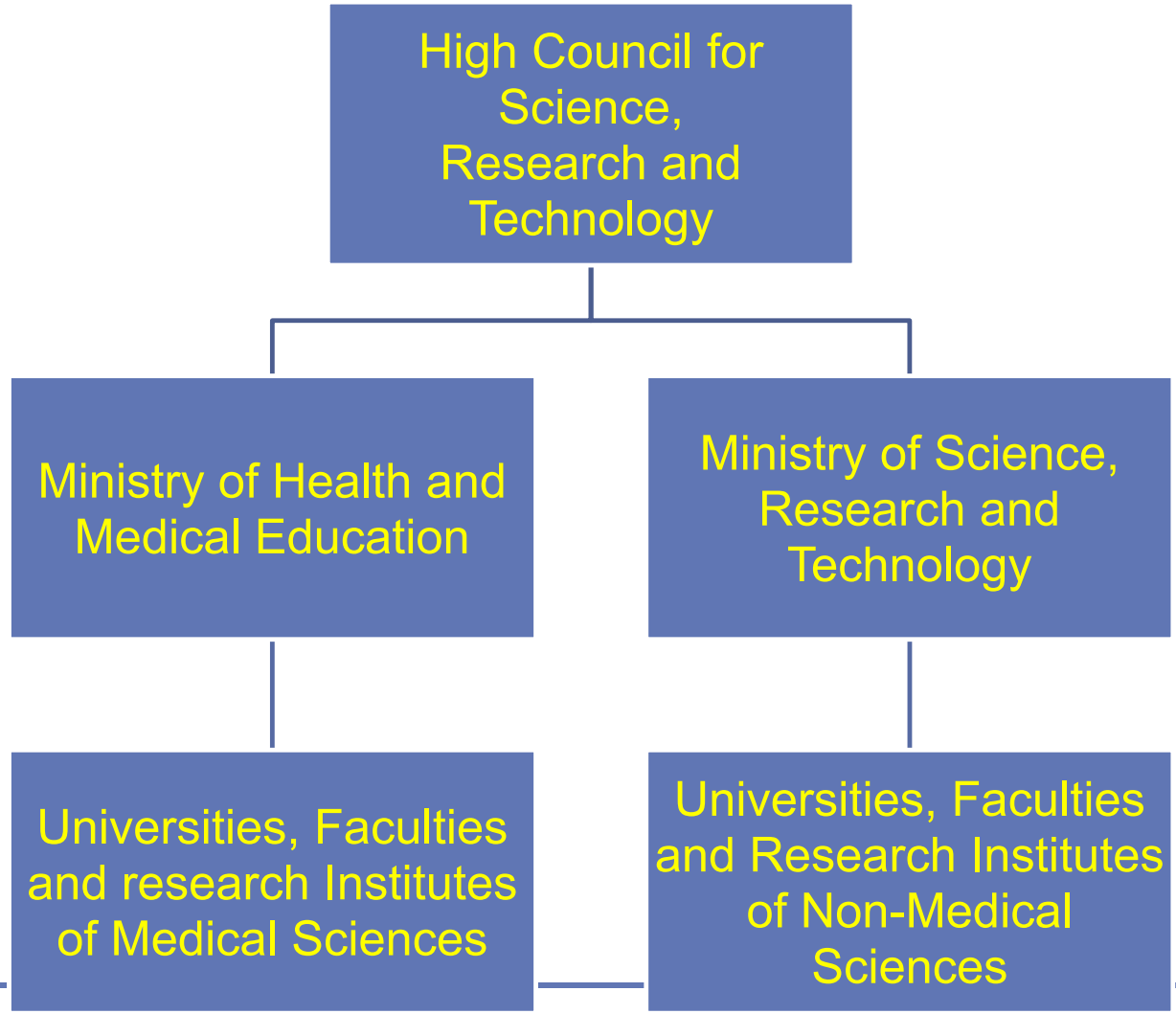
Medical Universities in Iran

- 50 public medical universities and 12 independent medical schools
  - 17,500 academic staffs
  - 160,000 students,5500 PH.D,11000 clinical postgraduate

- One private medical university: "**Islamic Azad University**"
  - 86 schools/faculty
  - 1798 academic staffs
  - 61,000 students

MEDICAL SCIENCES DIVISION
ISLAMIC AZAD UNIVERSITY

Science and Technology Structure in I.R.I.

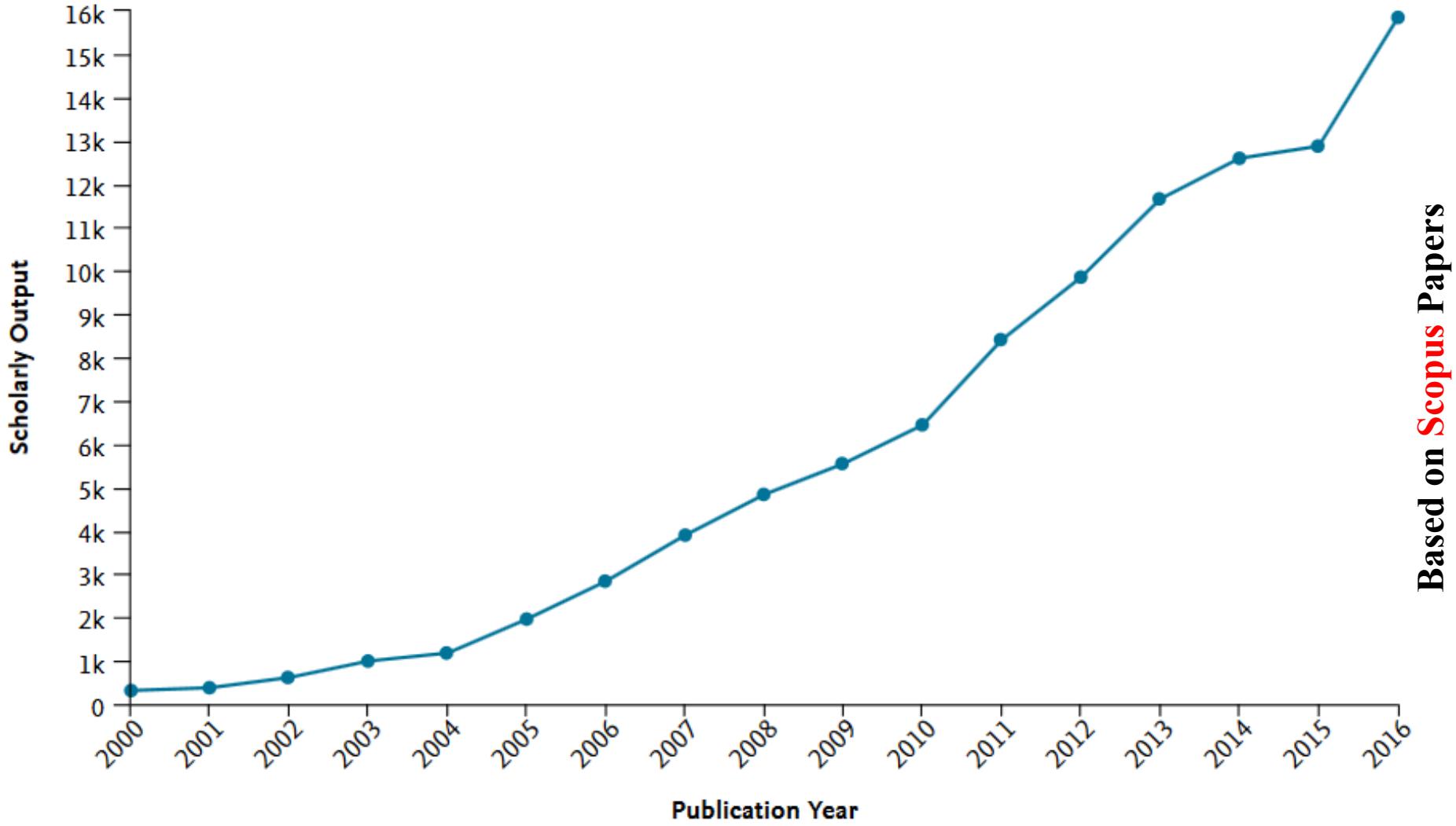


Bio-Medical Research in Iran

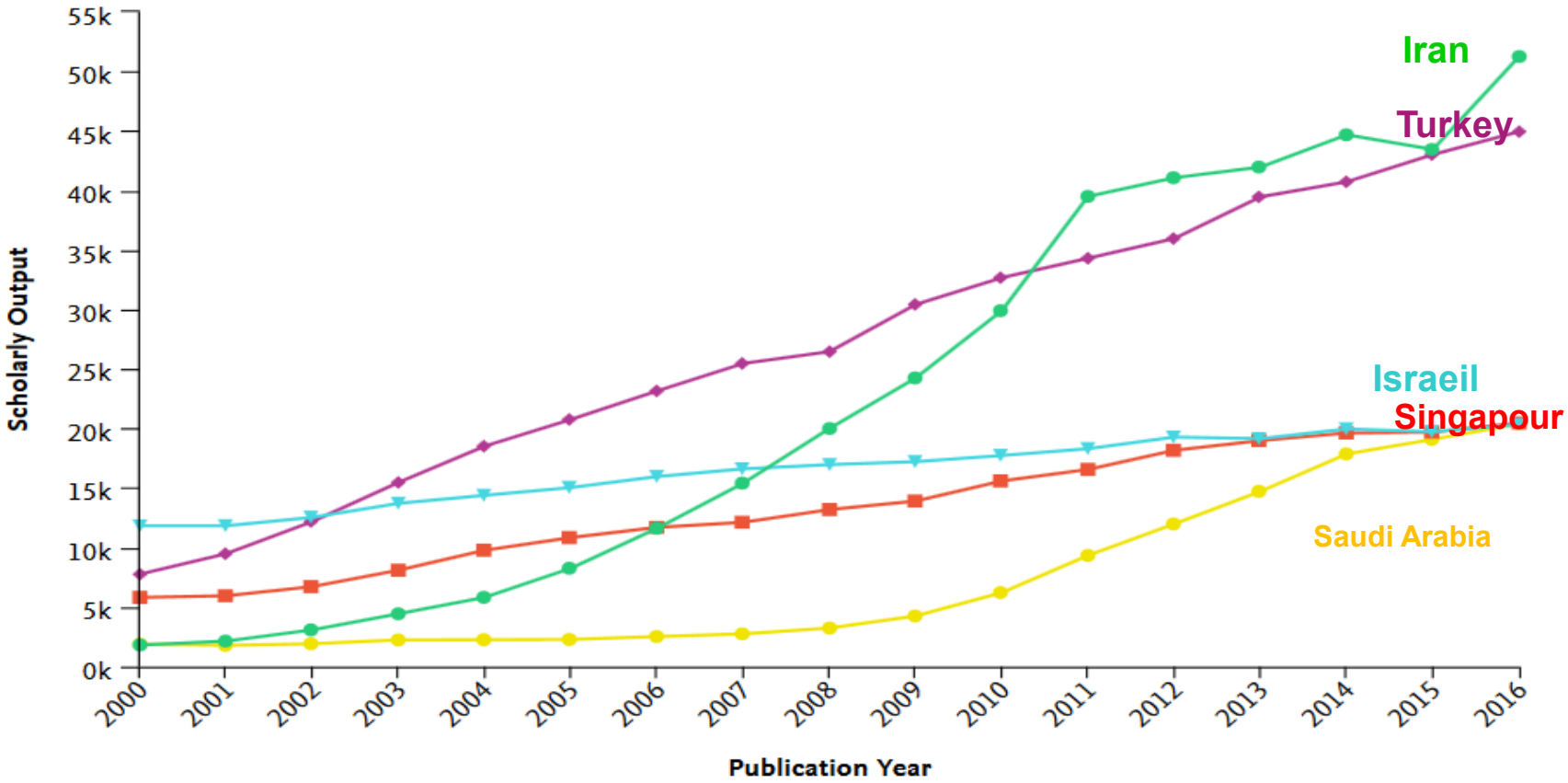
- 685 Research Centers
- 37 Research Institutes

- 388 Peer-review Journals
  - 72 indexed in MEDLINE
  - 47 indexed in Web of Science
  - 81 indexed in Scopus

Iran Ministry of Health Universities Publications Trend



Number of Published Papers in Scopus



National Institute for Medical Research Development (NIMAD)

National Institute for
Medical Research Development (NIMAD)
Islamic Rebpubic of Iran

NIMAD

National Institute for
Medical Research Development (NIMAD)
Islamic Rebpubic of Iran

- A public granting body which is established in **June 2015**
- NIMAD invest nearly **€7 million annually** in biomedical and health research
- There are **7 scientific committee**, which set priorities for research before each call for proposal
  - Non-communicable Diseases
  - Communicable Disease
  - Hematology and Cancer
  - Neuroscience and Mental Health
  - Pathology, Genetics and Cell Therapy
  - Drug Evaluation and Research
  - Health Technology and Innovation

NIMAD'S Achievements

National Institute for
Medical Research Development (NIMAD)
Islamic Rebpubic of Iran

- Acceptance rate of proposals: **11%**
- Principle Investigator (PI) should be affiliated to Iran but international collaboration in NIMAD's proposals is highly recommended and scored.
- **131** proposals accepted during **3** call for proposals
- **330** grants for Medical Universities Scholars
- **21** training workshops to improve research methodology.
- Establishment of Cochrane Iran Associated Center

Cochrane
Iran

گروه آناتومی
بخش بافت‌شناسی

SAPHIR
SAPHIR Network
Scientific Workshop Series

.Infrastructure for research

1-Establishment of Core laboratory facility

2- Animal Lab (small & large).

3-Adequate Space building.

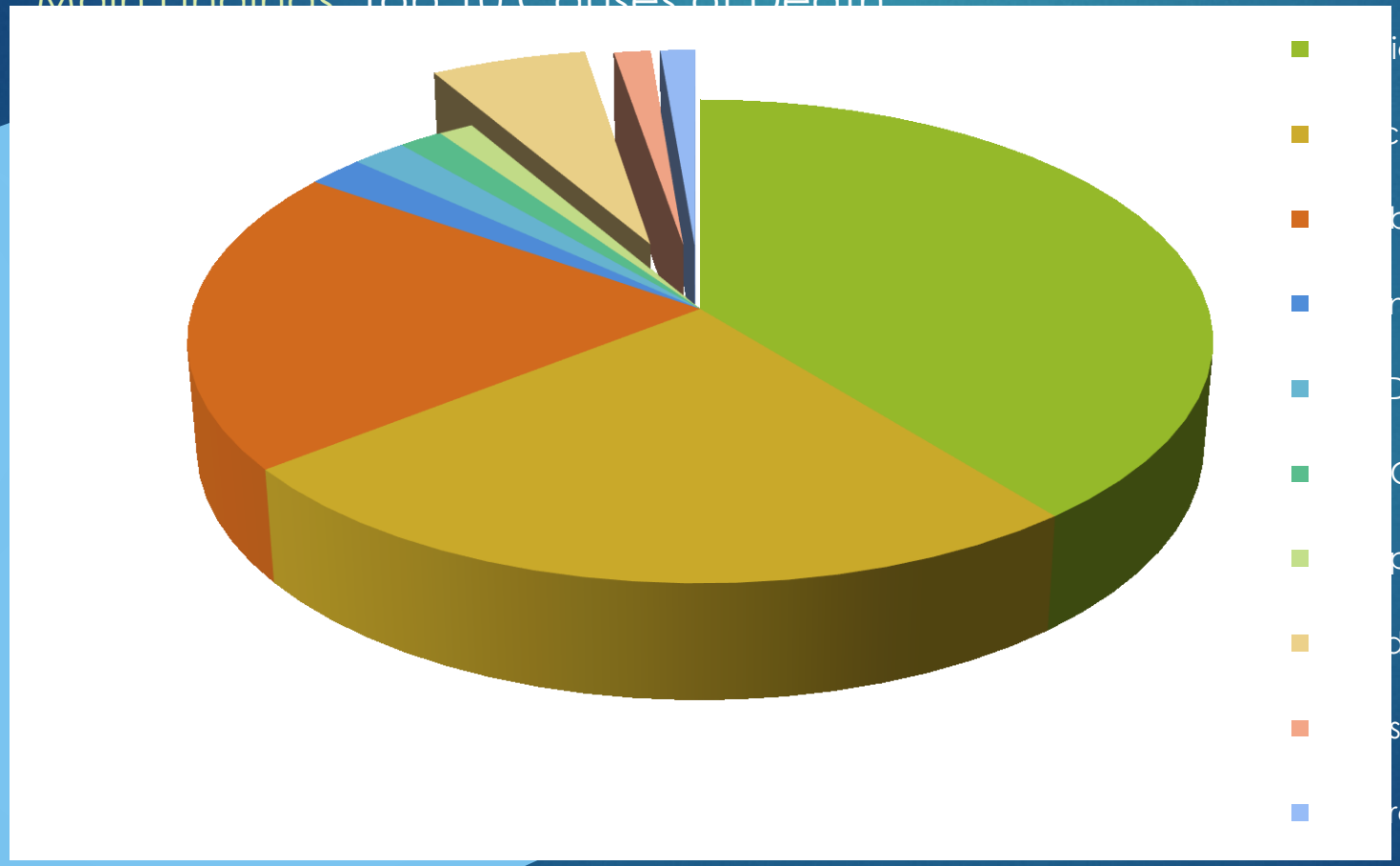
4-Mega project: invest in future!

Prospective Epidemiological Research Studies in IrAN

The PERSIAN Cohort

Golestan Cohort Study (GCS)

- Main Findings: Top 10 Causes of Death



Site Selection Criteria

- Cohort sites selected based on the following criteria:
  - Notion to include all major ethnic groups within Iran
  - Covering a large geographical region within Iran
  - Population stability and low migration rates
  - Local disease patterns and exposures to certain risk factors based on previous studies

Sample Selection Criteria

- Men and women, 35-70 years of age
  - Age range chosen since:
    - They have well established behaviors and lifestyles
    - Th
    - Th
- Participants must reside within the determined study location

Sample Size: 200,000 Individuals from 18 Sites

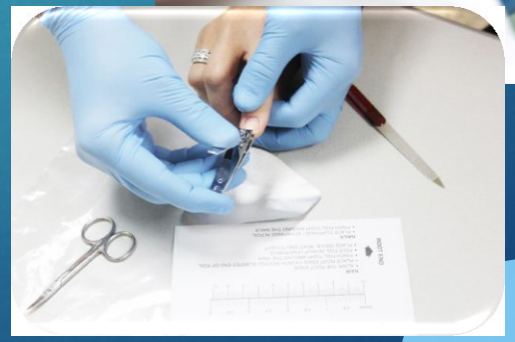
Ethnicities and Geographical Areas Included in the PERSIAN Cohort

Data Collection: Questionnaire Content

- 3 Parts: Medical, General and Nutrition
  - 22 Sections within these parts
  - Overall 482 Questions
    - Demographics
    - Socioeconomic Status
    - Occupational History
    - Fuel Exposure
    - Lifestyle
    - Circadian Rhythm
    - Physical Activity
    - Mobile Use
    - Toxin/Pesticide Exposure
    - Medical History
    - Family Medical History
    - Dental Health
    - Personal Habits
    - Anthropometrics
    - Blood Pressure and Pulse
    - Physical Examination
    - Reproductive History
    - Chronic Disease History
    - Food Frequency Questionnaire
    - Dietary Patterns
    - Supplement Use
    - Water Use

Sample Collection: Using TD Tubes

- **Blood**
  - 25 cc blood taken from each individual and stored as followed:
    - Whole blood—Two 1.5 ml Cryo Tubes
    - Plasma—Two 1.5 ml, and four 1 ml Cryo Tubes
    - Buffycoat—Two 1 ml Cryo Tubes
    - Red Blood Cells—One 1 ml Cryo Tube
    - Serum—Two 1.5 ml Cryo Tubes
- **Urine**
  - 5 cc taken and stored as
- **Hair**
  - About 200-300 strands 1-3 cm long
- **Nail**
  - Nails from all fingers and toes

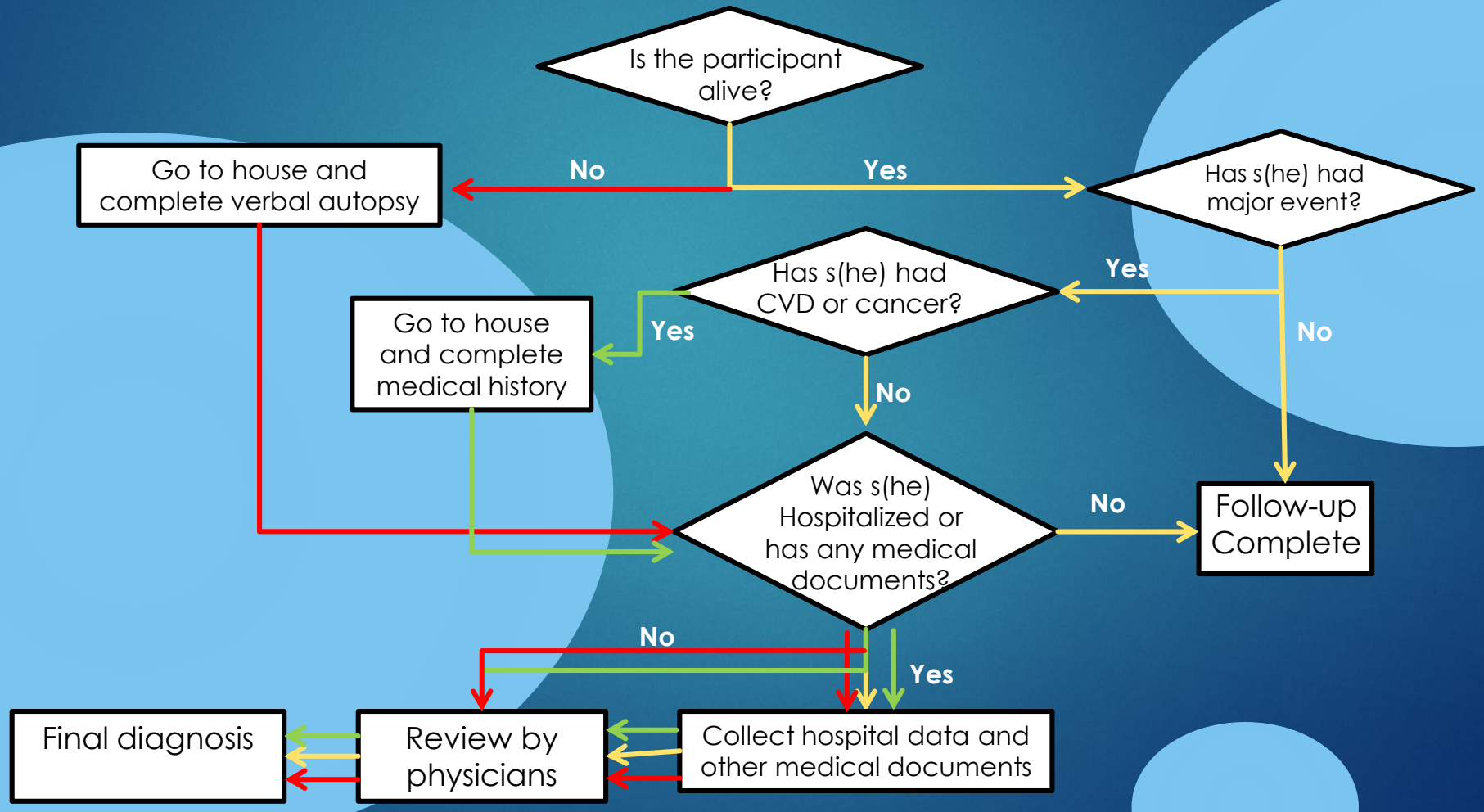


Outcomes of Interest

- Deaths by cause
- Incidence of major non-communicable diseases
  - Cardiovascular diseases
  - Cancers
  - Digestive Disorders
  - Respiratory Diseases
  - Renal Diseases
  - Hepatic Diseases
  - Neurological Diseases
- Trends in major risk factors
  - Anthropometric
  - Physiological
  - Lifestyle
  - Nutritional
  - Environmental

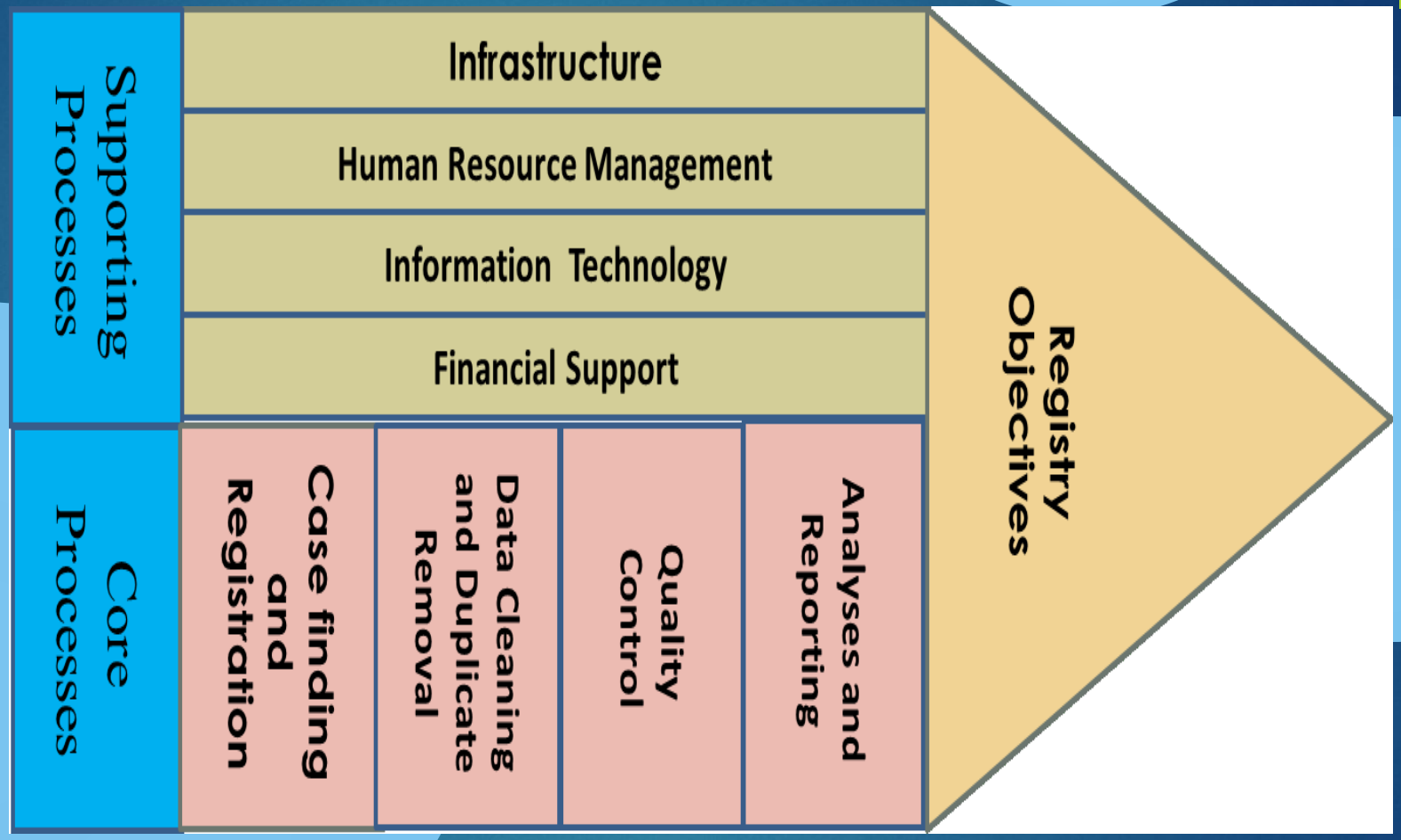
Follow Up Procedure

Annual telephone or active contact with participants



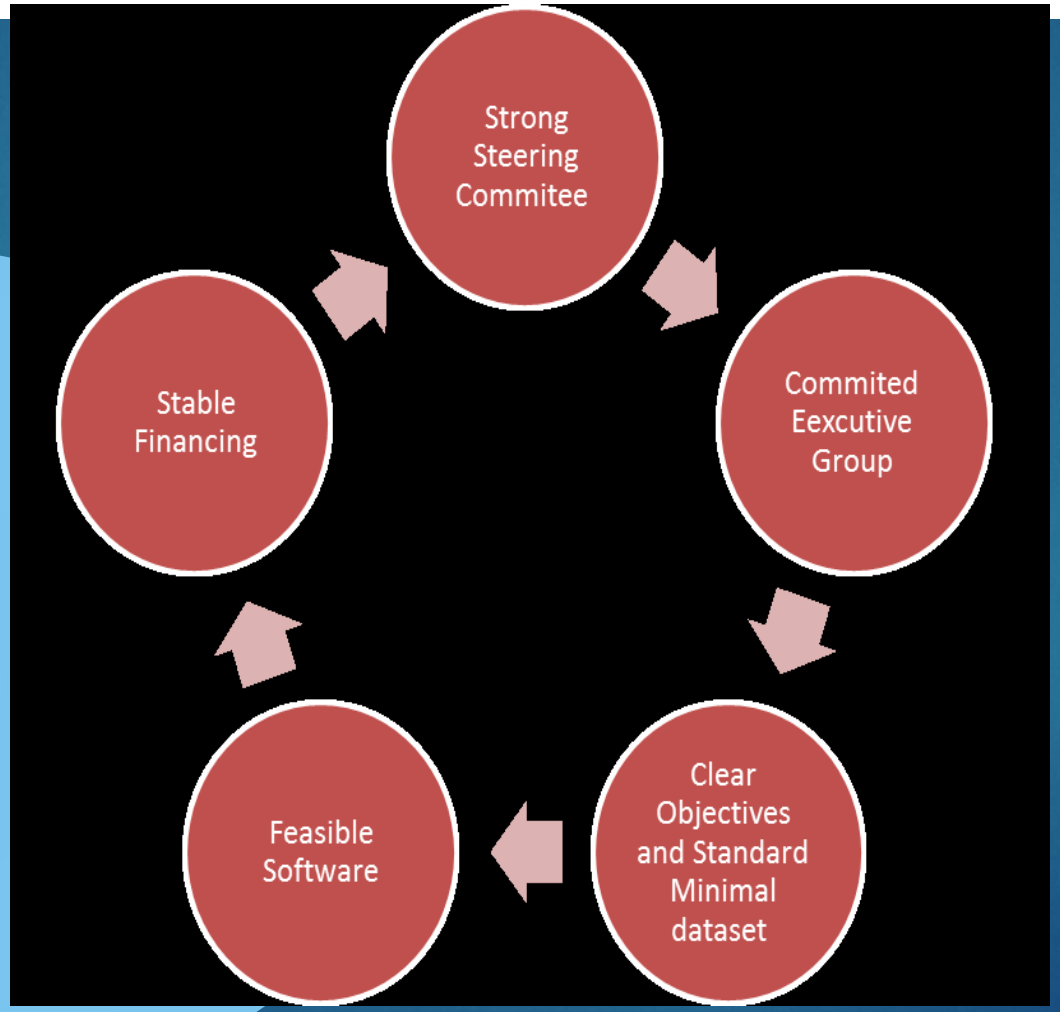
Diseases and Health Outcome Registries

- Importance:
- Registry programs create data bases to:
  - Assess Quality of Care and Monitor Clinical Guidelines and Improve clinical outcomes (Example: Trauma, Cardiovascular Disease, etc.)
  - Study incidence, prevalence, and mortality of common diseases and establish standard surveillance system (example: population based cancer registry)
  - Perform high quality basic, public health and clinical research using biobank and clinical data
  - To perform health economy research and health technology assessment.



Schematic introduction of the core and supporting process of a registry program

Main Requirements for successful registry program



Tables: The evaluation indicators of patient registry programs in I.R Iran	
Phase1: Initiation	1. Submit the proposal of patient registry program 2. Develop guidelines, data collection form, and registry manual 3. Design appropriate database and software 4. Collaboration with researchers and organizations in the national and international level 5. Performing Pilot phase
Phase 2: Implementation	1. Data collection and registration is routinely done 2. Performing Quality Control 3. Preparing Annual Report
Phase 3: Maintenance	1. Data Collection and registration of the data in a routine process. 2. Using data from patient registry in research programs. 3. Using the results from patient registry in clinical practice, policy making. 4. Performing Quality Control 5. Annual Report

Achievements: More than 50 Registry Programs

Number	Registry Name	Year Established	Geographical Extent	Scope
1	Alzheimer Disease	2016	Regional	Clinical
2	Asthma and Allergy	2016	National	Clinical
3	Autism	2015	National	Clinical
4	Autoimmune Bullous	2015	National	Clinical
5	Autoimmune Hepatitis	2016	Regional	Clinical
6	Brucellosis	2014	National	Clinical
7	Burn Registry	2017	Regional	Clinical
8	Pulmonary Cancers	2016	Regional	Clinical
9	Cardiovascular diseases (10 provinces)	2014	National	Clinical
10	Celiac Disease	2015	National	Clinical
11	Chronic Obstructive Pulmonary Disease (COPD)	2016	Regional	Clinical
12	Chronic Sinusitis with Nasal Polyps	2016	Regional	Clinical
13	Cochlear Implants	2015	Regional	Clinical
14	Congenital Anomalies	2003	National	Public Health
15	Cystic fibrosis	2016	Regional	Clinical

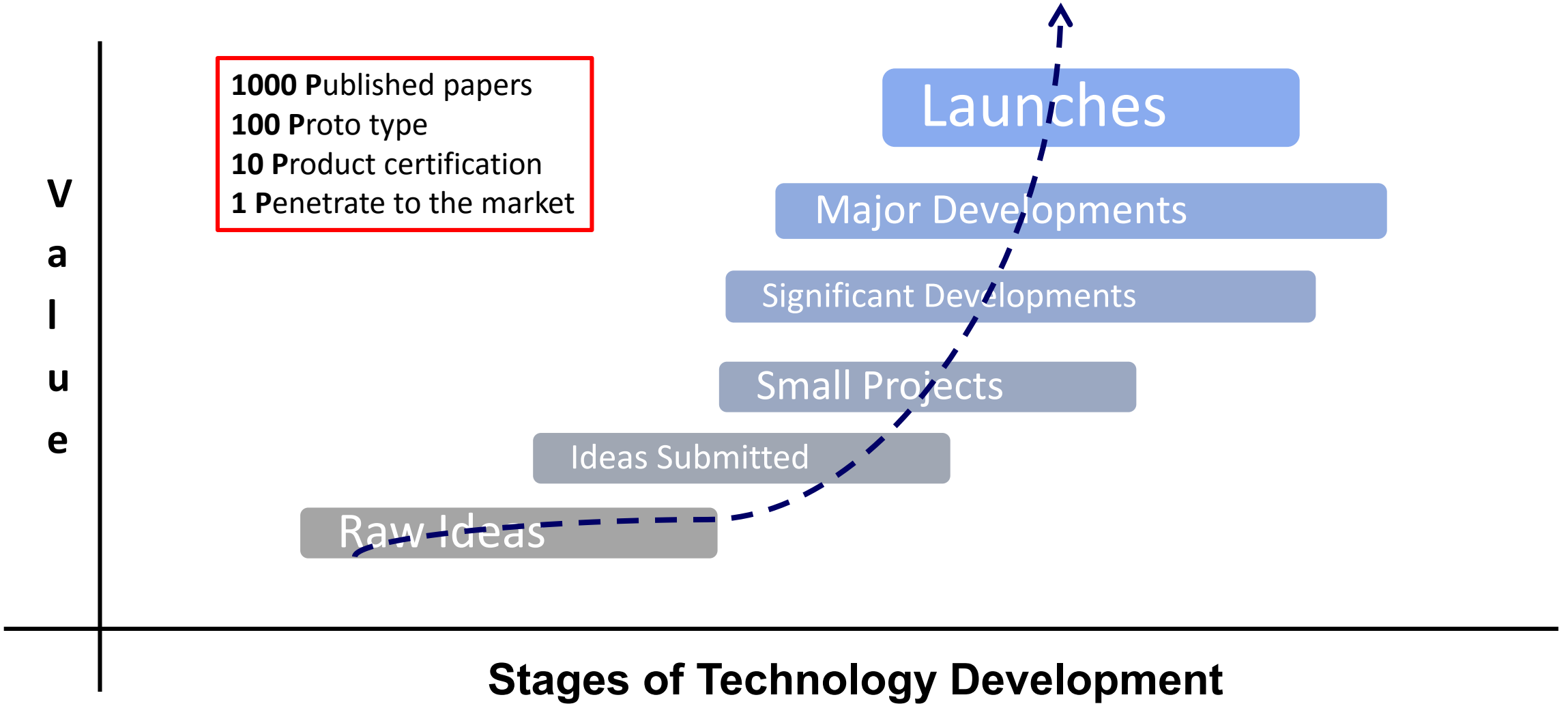
	Registry Name	Year Established	Geographical Extent	Scope
17	Diabetes	2016	National	Clinical
18	Divorce	2016	Regional	Public Health
19	Duchenne and Becker Muscular dystrophy	2009	National	Clinical
20	Childhood Endocrine Disorders		National	Clinical
21	Food Allergy	2016	National	Clinical
22	Hereditary Retinal Dystrophies and Degenerations	2016	Regional	Clinical
23	HTLV-1	2016	Regional	Clinical
24	Hydatid Cyst	2016	National	Clinical
25	Rheumatologic Disorders	2015	National	Clinical
26	Intensive Care Unit	2016	Regional	Clinical
27	Leishmaniosis	2013	Regional	Clinical
28	Multiple Sclerosis	2016	National	Clinical
29	National Tumor Bank	2016	National	Clinical
30	Neonatal Intensive CareUnit (NICU)	2015	National	Clinical
31	Nonalcoholic Fatty Liver Disease	2016	Regional	Clinical
32	Morbid Obesity	2014	Regional	Clinical
33	Olfactory Disorders	2016	Regional	Clinical
34	Pituitary Tumors	2014	Regional	Clinical
35	Poisoning	2016	Regional	Clinical
36	Population-based Cancer Registry (10	2006	National	Public Health

Main Items of Technology Activities

- Creating Venture Capital
- Supporting knowledge based small companies
- Developing clean rooms
- Financial supporting of technological projects
- Monitoring and evaluating technological activities

Value of Technology at Different Stages

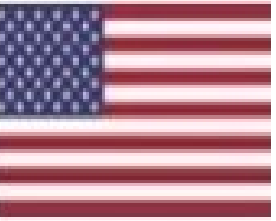
3000 Raw Ideas = 1 Commercial Success*



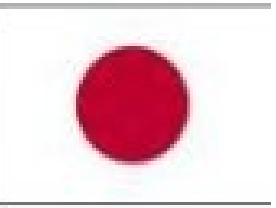
*: Greg Stevens and James Burley, 3,000 Raw Ideas = 1 Commercial Success, Research Technology Management, 40(3), May-June 1997, 16-27.

PATENT APPLICATIONS BY TOP FIELDS OF TECHNOLOGY (WIPO 2013)

Computer Technology
Digital Communication
Pharmaceutical



Computer Technology
Medical Technology
Pharmaceutical



Electrical Mashinery
Audio Visual
Technology
Optics

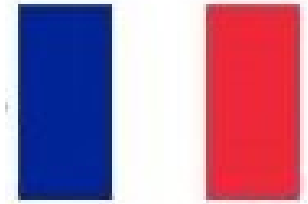
Semiconductors
Audio Visual
Technology
Computer Technology

Civil Enginenering
Transport
Other Special Mashines

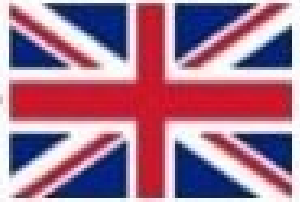
Pharmaceuticals
Medical Technology
Organic Fine Chemistry

Transport
Electrical Machinery,
Apparatus Energy
Mechanical Equipment

Transport
Organic Fine Chemistry
Electrical Machinery,
Apparatus Energy



Pharmaceuticals
Organic Fine Chemistry
Medical Technology



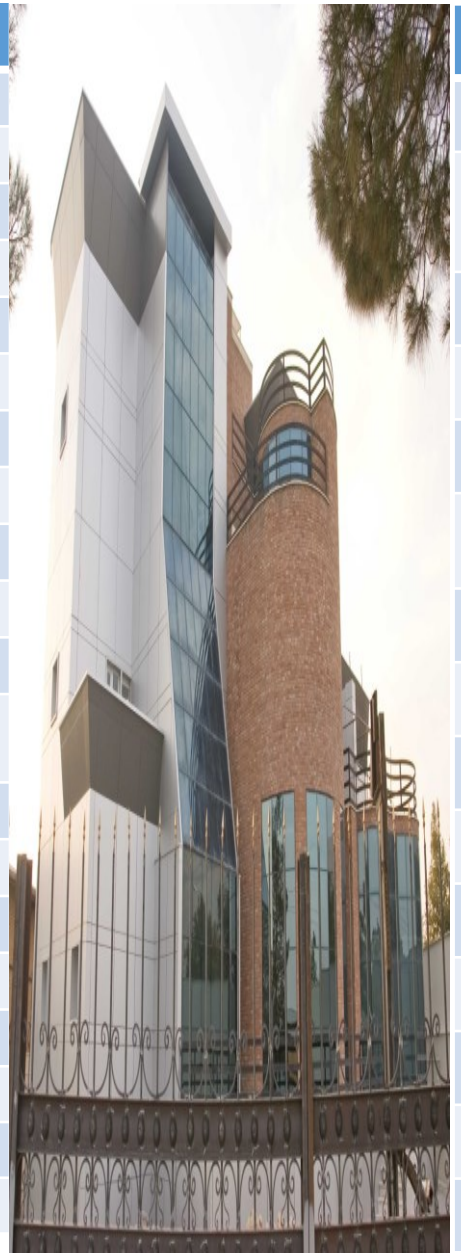
Food Chemistry
Medical Technology
Measurments

Consumer Goods
Furniture, Games
Pharmaceuticals

Iranian Biopharmaceutical Products

No	Generic Name	Company
1	IFN alpha	Pastuer Institute, Poyesh Daru
2	G-CSF	Poyesh Daru
3	EPO alpha	Notarkib, Pastuer Institute, Poyesh Daru
4	IFN beta 1a (CinnoVex)	Cinnagen
5	IFN beta 1a (ReciGen)	Cinnagen
6	Epo ß	Cinnagen
7	PTH	Cinnagen
8	Trastuzumab	Aryogen Pharmed
9	Interferon beta 1ß	Zist Daru Danesh
10	Interferon gamma	Notarkib, Pastuer Institute, Daru
11	Peg-Interferon alpha	Poyesh Daru
12	Antihaemophilic factor VII	Aryogen Pharmed
13	HBS (Vaccine)	Pastuer Institute
14	Factor VIII	Samen
15	PEG-G-CSF	Cinnagen
16	FSH	Cinnagen
17	Etanercept / Rituximab	Aryogen Pharmed
18	Antihaemophilic factor VII	Pastuer Institute
19	Antihaemophilic factor VIII	Pastuer Institute
20	Adalimumab	Cinnagen

600 million $ saving



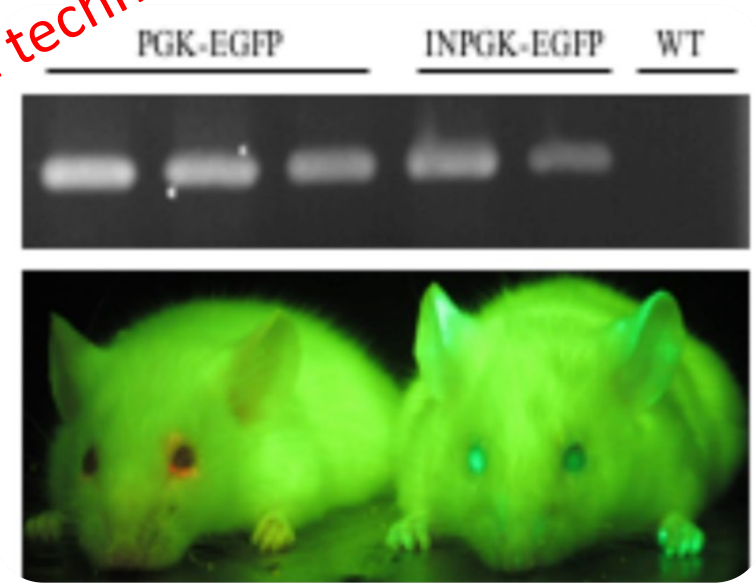
No	What is in pipeline?.
۱	HGH (هورمون رشد)
۲	Bevacizumab (Avastin)
۳	Vedolizumab
۴	Cetuximab
۵	Denosumab
۶	Natalizumab
۷	Pertuzumab
8	Adotrastuzumab
9	Tocilizumab
10	Cerezyme
11	T-PA
12	Darbepoetin
13	Adalimumab
14	LH
15	ATG

350 million $ saving

No	Under investigation
۱	Ranibizumab
۲	Imiglucerase
۳	Laronidase
۴	Asparginase
۵	peg- Asparginase
۶	Romiplostim
۷	Sirolimus

مرکز رشد بیس ژن
مرکز رشد فناوری فرآورده‌های بیولوژیک و دامی

Health technologic updated



	Title	Unit
1	Iranom/ NGS	Genetic research center
2	Clinical trials of the products	Private/Tehran Uni.
3	Transgenic Animals/ Gene therapy	Kordestan Uni.
4	Cell therapy	Rouyan
5	Linear Accelarator	Private/Governmental
6	Vaccines	Pasteur institute
7	Health Leaser technology	Leaser research center
8	Micro fluidic technology	Private/Governmental
9	Biotechnology medicine	Private/Governmental
10	Medical Nanotechnology materials	Zanjan Uni.
11	Implantable Motor Neuro prosthesis	Sci. and technology Uni.
12	Virous drug delivery development	

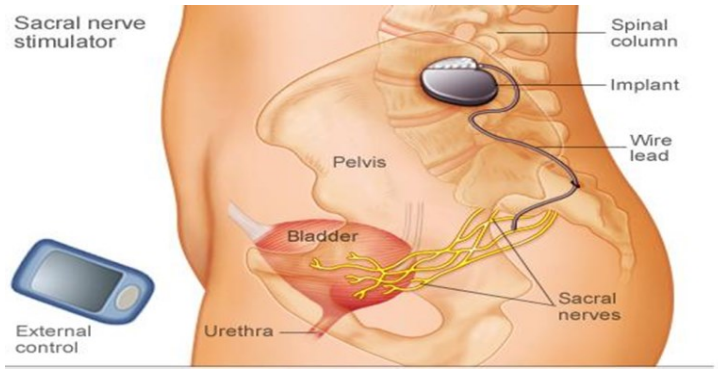
اولین پروژه آنالیز DNA

پروژه ایرانوم:
دستگاه ۵۰۰ necseq
دستگاه miseq

Implantable Motor Neuroprosthesis:

for Restoring Motor Function in Tetraplegics

for Bladder Control



Exoped Robotic Exoskeleton

Steps to forward

- Bio-medical research collaboration with Germany is very welcomed
- Offering specific number of research grants for Iranian Medical Universities
- Collaboration between NIMAD/ European Granting bodies in supporting sabbaticals for scientists exchanges
- Schengen visa facility for faculties and post-graduate students in the European Embassies