



Assessment of disease burden based on realtime national registers on hospital discharges and contacts with primary healthcare

The 13th Nordic Public Health Conference in Reykjavík 2022

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- National health registers in Iceland
- Examples of calculations based on our NDR and our PHCR
 - Annual public health indicators
 - Annual performance and quality indicators
- Covid-19
- Volcanic eruption on Reykjanes peninsula
- Payment systems





Health registers

(Medical Director of Health and Public Health Act)

Embætti landlæknis



Directorate of Health organises and maintains national health registers and publishes health statistics (law 2007)

The Medical Director of Health shall, ...organize and maintain national registers on health, diseases, accidents, prescriptions, births, and the work and performance of the health service.

The purpose of the registers is to gather information on health and the health service, to monitor the service, to ensure its quality and assess its performance, and to use the registers in planning for quality development in the health service and in scientific research.



National health registers in Iceland and data providers

Main data providers:

- Hospitals
- Primary healthcare centres
- Pharmacies
- Private practicing physicians
- Nursing homes

Main national registers:

- Cancer register
- Causes of death register
- Medical birth register
- Register of communicable diseases
- Prescribed drugs register



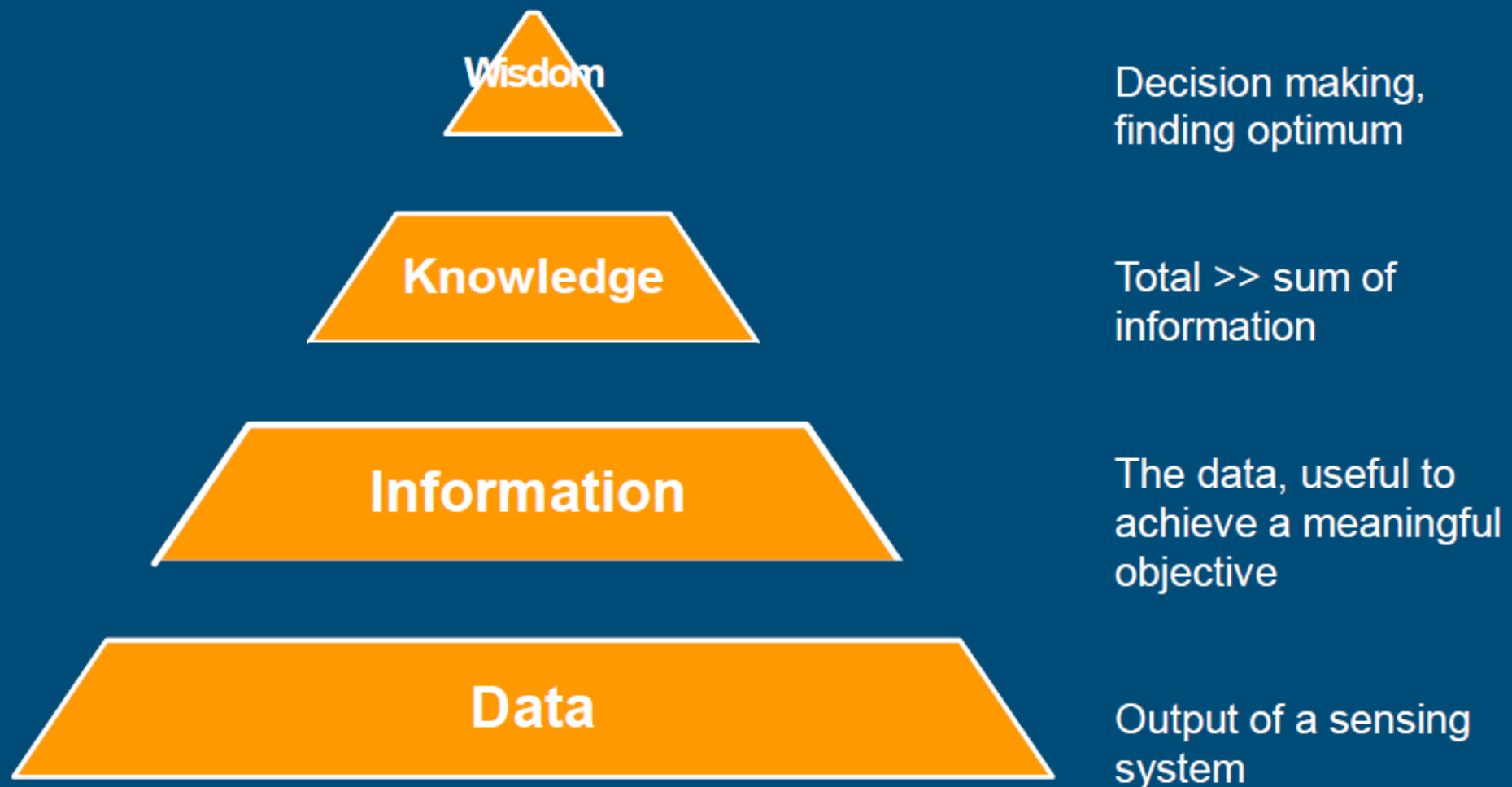
Main registers cont.:

- Register of vaccinations
- Hospital discharge register
- Primary healthcare contact register
- Contacts with private practicing specialists
- Coronary events register
- Accident register
- Nursing home pre admission assessments register
- Register of interRAI assessments
- Register of licenced health professionals
- Register of operating agencies in health service

Mostly real time data transfer into national registers



DIKW-pyramid (Rowley, 2007)





Public health indicators in health promoting communities since 2016

Suðurnes

Public health indicators 2018



- The health district is statistically different from the whole country
- The health district is not statistically different from the whole country
- Not tested for statistical significance
- Mean for Iceland
- Distribution in the seven health districts

Public health indicator		Year	District	Iceland	Unit	Suðurnes
Demography	1 Population size	2017	24.882	343.400		
	2 Population (growth/decrease)	2013-17	16,4	6,1	%	
	3 Population ≥ 80 years old	2017	2,3	3,6	%	
	4 Sex ratio	2017	1,1	1,0	m/f	
	5 Births <20 years old	2013-17	18,3	7,0	/1.000	
	6 Reading comprehension (9. class)	2017	67,2	82,5	%	
	7 University education	2017	21,4	37,8	%	
	8 Financial difficulties	2017	13,4	12,3	%	
Health behavior	9 Happiness, adults	2017	56,9	59,9	%	
	10 Well-being, adults	2017	26,3	26,2	%	
	11 Discomfort at school (8.-10. class)	2018	14,1	10,3	%	
	12 Loneliness (8.-10. class)	2018	12,1	9,8	%	
	13 Insufficient sleep (8.-10. class)	2018	49,6	42,0	%	
	14 Insufficient sleep, adults	2017	38,4	28,1	%	
	15 Stress, adults	2017	23,0	23,9	%	
	16 Active travel mode, adults	2017	12,9	20,5	%	
	17 Participation in sports activities (8.-10. class)	2018	49,6	52,1	%	
	18 Fruit and vegetable consumption, adults	2017	8,5	10,9	%	
	19 Consumption of soft drinks (8.-10. class)	2018	10,9	7,2	%	
	20 Consumption of soft drinks, adults	2017	29,1	18,0	%	
	21 Lifetime violence, adults	2017	32,9	30,4	%	
	22 Harmful drinking, adults	2017	22,1	25,1	%	
	23 Use of e-cigarettes (10. class)	2018	27,5	22,4	%	
	24 Smoking, adults	2017	18,2	9,4	%	
	25 Oral tobacco use, adults	2017	3,3	4,9	%	
	26 Use of cannabis, adults	2017	2,1	1,9	%	
Health and diseases	27 Physical health fair/poor, adults	2017	31,4	25,8	%	
	28 Mental health fair/poor, adults	2017	26,6	21,2	%	
	29 Antidepressant use, males	2017	82,8	96,0	DPD	
	30 Antidepressant use, females	2017	170,7	177,0	DPD	
	31 BMI ≥ 30, adults	2017	35,7	26,6	%	
	32 Anti-diabetic medication other than insulin	2017	41,3	33,9	DPD	
	33 Lipid-lowering drugs	2017	89,8	88,3	DPD	
	34 Cardiovascular mortality rate, females	2013-17	231,5	168,9	/100.000	
	35 Incidence of cancer, males	2007-16	602,2	544,2	/100.000	
	36 Incidence of cancer, females	2007-16	483,8	459,6	/100.000	
	37 Use of antibiotics < 5 years old	2017	1.130,8	1.088,0	/1.000	
	38 Childhood vaccination, 12 months	2018	89,0	90,8	%	
	39 Childhood vaccination, 4 years old	2018	77,6	86,3	%	
	40 Screening for cervical cancer	2017	56,2	66,2	%	
	41 Screening for breast cancer	2017	47,0	57,1	%	
	42 Prosthetic replacement of hip joint	2013-17	213,8	239,6	/100.000	
	43 Waiting for nursing home, ≥ 67 years old	2017	5,8	7,6	/1.000	
	44 Visits to specialized physicians	2017	1,3	1,4	/inhabitant	

The aim of public health indicators is to **provide a profile of health, well-being, health behaviour and demography on sub-national level** to support local actions in health promoting communities.

The aim of **health promoting communities** is to create environment that promotes healthy behaviour and lifestyles, health and well-being of all in communities.

We do not always have good **data on disease prevalence**, in those cases we try to utilize e.g. the national discharge register, the prescribed drugs register and primary health care contact register. There we have information on patients' residence.



Make local data easily available – online dashboard (Hip replacements)

Liðskiptaaðgerðir á mjöðm

Liðskiptaaðgerðir á mjöðm, á 100.000 íbúa



Ár valið

2021

Ár

All

Kyn

All

Heilbrigðisumdæmi



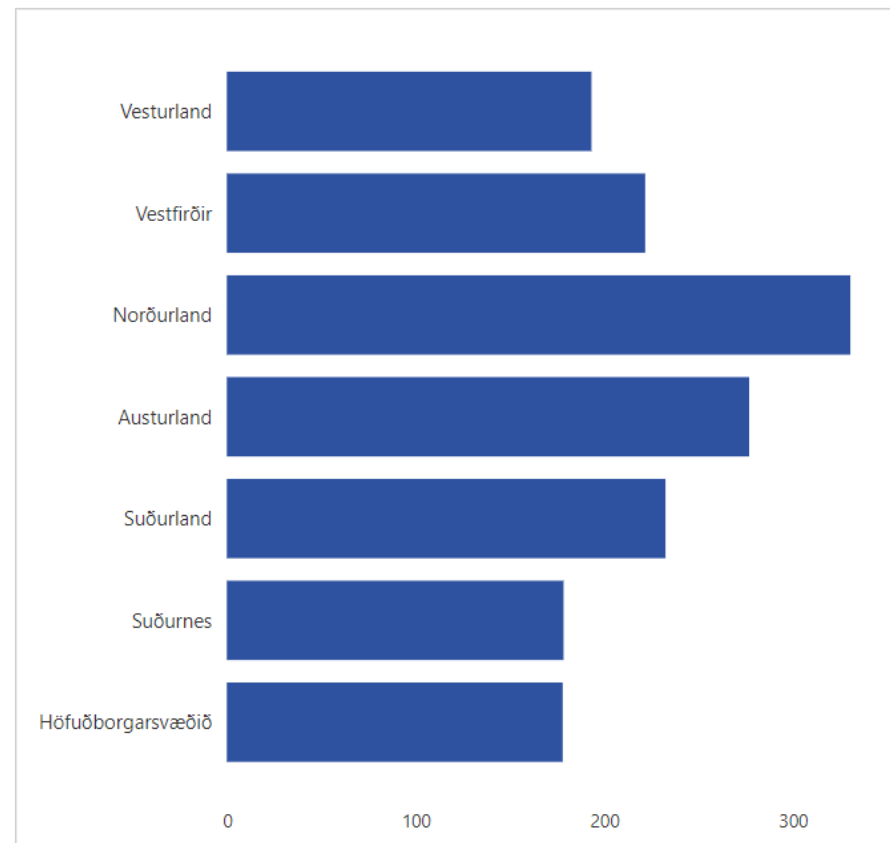
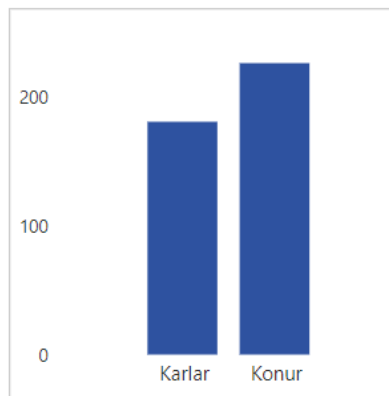
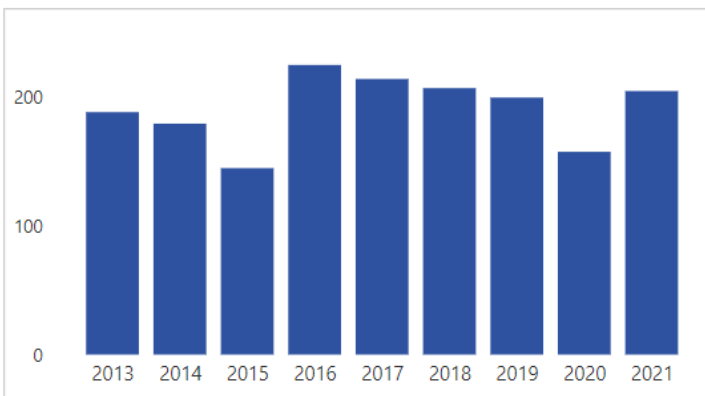
Sveitarfélög

Aðgerðir/100.000 íbúa

204.6

Á árinu 2021 voru á landsvísu framkvæmdar 204.6 liðskiptaaðgerðir á mjöðm á hverja 100.000 einstaklinga

Heilbrigðisumdæmi	Aðgerðir/100.000 íbúa	Vikmörk	Marktekt
Vesturland	193.3	57.1	
Vestfirðir	221.8	108.7	
Norðurland	330.6	53.4	Hærra*
Austurland	276.9	94.5	
Suðurland	232.6	48.9	
Suðurnes	178.5	52.8	
Höfuðborgarsvæðið	178.1	16.7	



Number of operations per 100.000 pop. by pts' residence

* = Marktekt frábrugðið í samanburði við landið allt (p<0,05)



Healthcare performance and quality indicators

Indicator	Year	Iceland	Progress	Nordic	OECD	
Expenditure						
Health expenditure	% VLF	2019	8,5	▼	9,8	9,8
Health expenditure per capita	USD PPP	2018	434,0	▼	510,0	394,4
Healthcare workforce						
Practising physicians	Per 1.000	2019	3,9	▲	4,0	3,5
Practising qualified nurses and practical nurses	Per 1.000	2020	15,6	▲	13,5	8,8
Employment in health and social work as a share of total employment	%	2017	10,9	▼	16,4	10,1
General practitioners	Per 100.000	2015	51,7	—	69,0	62,1
Infrastructure						
Hospital beds	Per 1.000	2020	2,8	—	4,1	4,4
Intensive care beds	Per 100.000	2019	60,0	▼	51,0	46,0
CT scanners, MRI units and PET scanners	Per 100.000	2019	60,0	▼	51,0	46,0
Access and prevention						
Private household out-of-pocket health expenditure as a proportion of total	%	2017	17,9	▼	17,8	23,8
Population forgoing care because of affordability	%	2014	20,9	▼	16,9	17,2
Time replacement waiting times (median)	Days	2021	280	▼	90,5	112,5
Prevention						
Percent of children aged 1 vaccinated against measles	%	2021	93,6	—	95,4	94,8
Percent of children aged 1 vaccinated against dTP	%	2020	91	—	96,0	95,1
Percent of population aged 65 and over vaccinated for influenza	%	2020	54,6	▲	45,3	42,3
Mammography screening in women aged 50-69 within the past 2 years	%	2016	66,7	▼	79,1	57,9
Cervical cancer screening in women aged 20-69 within the past 3 years	%	2016	63,3	▼	71,8	59,9
Mortality						
Mortality from preventable causes	Per 100.000. Age stand.	2019	81,0	▼	100,8	120,0
Mortality from treatable causes	Per 100.000. Age stand.	2019	41,0	▼	50,0	70,0
Premature mortality in people 15-69 years for four noncommunicable diseases	Per 100.000. Age stand.	2016	179,5	▲	204,8	379,6
Thirty-day mortality after admission to hospital for AMI	Per 100 disch. 45 y.o.+ Age stand.	2017	2,3	▲	4,2	6,9
30-day mortality after admission to hospital for ischaemic stroke	Per 100 disch. 45 y.o.+ Age stand.	2017	4,1	▲	5,1	7,7
Death from suicide within 30 days after discharge among patients diagnosed with a mental disorder	Per 10.000 patients. Age stand.	2015-2017	1,0	—	12,6	12,4
Inpatient suicide amongst patients with a psychiatric disorder	Per 10.000 patients. Age stand.	2015-2017	8,6	—	7,1	3,5
Cancer - survival						
Breast cancer five year net survival (all stages)	%	2014-2019	89,1	▲	87,7	84,8
Colorectal cancer five year net survival	%	2010-2014	68,2	▲	64,9	62,1
Cervical cancer five year net survival	% Age stand.	2010-2014	80,1	▲	65,7	71,7
Preventable hospital admissions						
Chronic Obstructive Pulmonary Diseases (COPD) hospital admission	Per 100.000. Age stand.	2020	100,6	—	192,6	183,3
Diabetes hospital admission	Per 100.000. Age stand.	2020	37,1	▲	84,6	127,1
Hip fracture surgery initiated within 2 days after admission to the hospital	% patients 65 +	2020	96,7	▲	93,5	80,9
Consumption of medicines						
Diabetic patients with at least one prescription of cholesterol lowering medication	%	2017	69,7	—	70,6	—
Polyparmacy in adults aged 75 and over: primary and long-term care	%	2017	54,8	▼	66,0	52,4
Proportion of the adult population who are chronic opioid users	%	2017	9,6	▼	5,7	2,3
Long-term use of benzodiazepines and benzodiazepine related drugs in people aged 65+	Per 100.000 65+	2020	99,4	▼	40,0	49,9
Overall volume of opioids prescribed	DDD per 1.000/day	2017	40,2	▼	22,9	16,5
Overall volume of antibiotics prescribed	DDD per 1.000/day	2017	24,6	▲	15,2	18,3
Deliveries						
III and IV degree tears in vaginal deliveries - all deliveries	%	2016	4,0	▼	2,5	—
Number of caesarean sections	%	2017	16,3	—	17,1	28,1

Data from the National Discharge Register

Quality and safety

Indicator	Year	Iceland	Progress	Nordic	OECD	
Mortality						
Thirty-day mortality after admission to hospital for AMI	Per 100 disch. 45 y.o.+ Age stand.	2017	2,3	▲	4,2	6,9
30 day mortality after admission to hospital for ischaemic stroke	Per 100 disch. 45 y.o.+ Age stand.	2017	4,1	▲	5,1	7,7
Preventable hospital admissions						
Chronic Obstructive Pulmonary Diseases (COPD) hospital admission	Per 100.000. Age stand.	2020	100,6	—	192,6	183,3
Diabetes hospital admission	Per 100.000. Age stand.	2020	37,1	▲	84,6	127,1
Hip fracture surgery initiated within 2 days after admission to the hospital	% patients 65 +	2020	96,7	▲	93,5	80,9
Deliveries						
III and IV degree tears in vaginal deliveries - all deliveries	%	2016	4,0	▼	2,5	—
Number of caesarean sections	%	2017	16,2	—	17,1	28,1

- ▲ Positive progress
- ▼ Negative progress
- Status quo

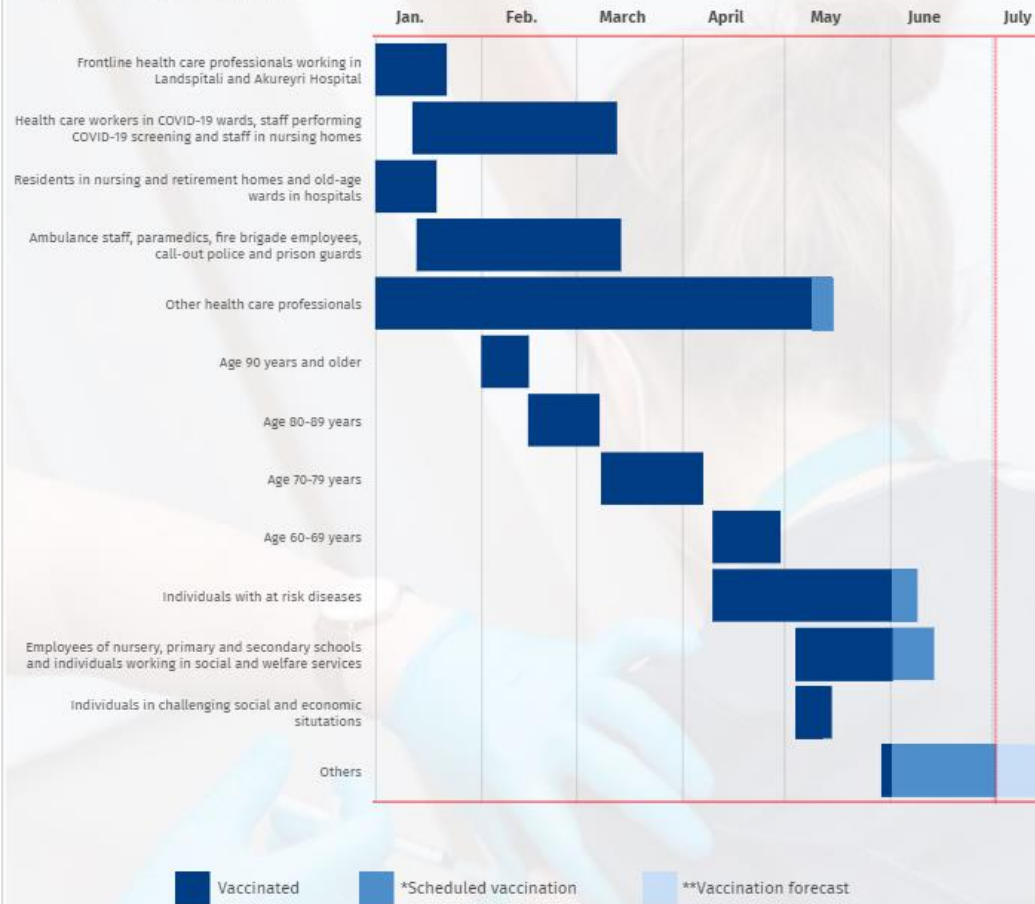


Covid-19 pandemic – initial vaccinations

Vaccination calendar

Updated: 31.05.2021

- Will be updated regularly



*Scheduled vaccination: Based on existing vaccine delivery schedules.

**Vaccination forecast: Based on contracts but might be subjected to changes based on marketing authorisations and delivery schedules.

The calendar is intended to give an indication of when vaccination is scheduled to start in individual priority groups, but not when people will be fully vaccinated.

National registers used – real time

- ① Register of Primary Health Care Contacts
- ② Hospital Discharge Register
- ③ Prescription Medicines Register
- ④ Register of Nursing home admissions
- ⑤ Register of Licensed Healthcare Practitioners
- ⑥ Register of Communicable Diseases
- ⑦ Vaccination Register



Surveillance – volcanic eruption 2021

Vikuleg vöktun gaseitrunar

fyrir sóttvarnalækni

Weekly report on toxic effect of carbon monoxide and other gases - real time data from two national register



Skilgreining á gaseitrun - afmörkun gagna

Samskiptaskrá heilsugæslustöðva:

ICD-10: T58, T59.1, T59.5, T59.6, T59.7, T59.8, T59.9
Allar greiningar (ekki bara aðalgreiningar)
Samskiptategund: Viðtal

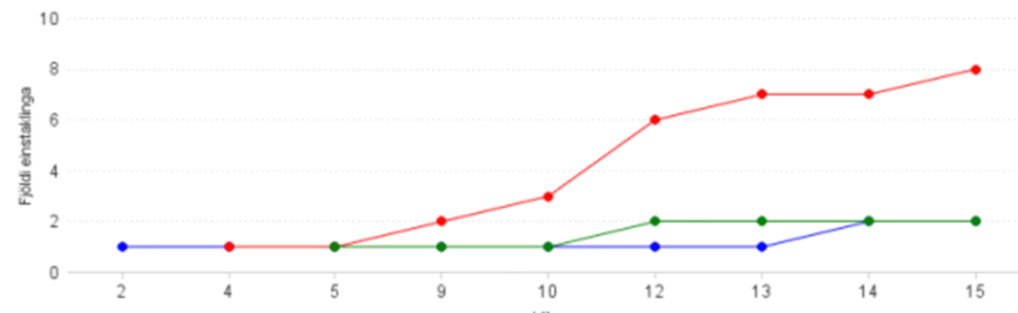
Vistunarskrá heilbrigðisstofnana (sjúkrahús):

ICD-10: T58, T59.1, T59.5, T59.6, T59.7, T59.8, T59.9
Allar greiningar (ekki bara aðalgreiningar)

Innlent | mbl | 11.4.2021 | 9:41 | Uppfært 11:26
Íbúar Suðurnesja fylgist með gasmælum

Ógleði og krampi eftir gaseitrun við gosstöðvarnar
© 08.04.2021 - 19:40 Innlent · Eldgos á Reykjaneskaga · Eldgos í Geldingadöllum

Gaseitrun - uppsafnaður fjöldi einstaklinga 2021



Komur á sjúkrahús: Gaseitrun - uppsafnaður fjöldi einstaklinga



afnaður fjöldi - innlagnir á sjúkrahús



Payment model í Primary health care (2017)

- **ACG:** 40% of the reimbursement based on disease burden that is calculated by using ACG (Adjusted Clinical Groups). Data from the national register of Primary healthcare contacts.
- **DRG:** Now we are preparing DRG calculations based on our hospital discharge register in accordance with a policy for Iceland's health services until 2030.
- We are starting with the two largest hospitals.
 - Motivates more complete and accurate registration
 - Will benefit data quality and therefore all utilization of NDR data



Thank you!

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