

# Vastupidamine ja taastumine - infektsioonhaigused pandeemias ja selle järgselt

Mait Altmets

28.11.2023



SOTSIAALMINISTEERIUM



TARTU  
ÜLIKOOI



Euroopa Liit  
Euroopa  
Regionaalarengu Fond



Eesti  
tuleviku heaks

# Teemad

- Infektsioonhaiguste eriala
- Kogemused pandeemiast
- Eelseisvad väljakutsed

# Infektsioonhaigused

## Ambulatoorne

HIV sh PreP  
B- ja C-hepatiit  
Vaktsineerimine  
Reisimed nõustamine  
jne

## Infektsioonikontroll

Antibiootikumide hea majandamine  
Tervishoiutekkestes infektsioonide ennetus  
Tervishoiutekkestes infektsioonide, MDR mikroobide  
seire, puhangute lahendamine  
Koolitus

## Statsionaar

Ägedad keskkonnatekked ja tervishoiutekked  
infektsioonid  
Immuunpuudulikkusega patsiendid  
HIV  
Dif diagnostilised patsiendid  
Malaaria ja muud troopilised infektsioonid

## Õppetöö

Residentuur  
Praktika

Infektsioonhaiguste arstide poolt konsulteeritud ravijuhtudel 19% madalam  
haiglasisene suremus ning 41% kulude kokkuhoid (Prantsusmaa, 2016)

# Meie kogemused

- Hea kaastatus haiglates
- Ülekoormus
- Teiste erialade toetus +/-
- Koostöö riigiasutustega
- Erialasisene koostöö väga hea

**Table 1**

Status of infectious disease training and service provision in 33 European countries (full or associate members of UEMS)

	ID specialists (n)		Trainees/year (n)	ID trainers (n)	Training centres (n)	Workforce planning	Training in ID (total)		Training in GIM	Paediatric ID	Formal exam
Countries in which ID is a specialty	Total in 2020 <sup>h</sup>	Total/million inhabitants [14]	Total in 2020 <sup>h</sup>	In 2020 <sup>h</sup>	Total in 2020 <sup>h</sup>	National policy	Official curriculum	Duration (years)	Duration (years)	Specialty status	Form of exam
Armenia	55	18	10	15	2	—	Yes	3	—	Subspecialty	o, w
Croatia	130	32	30	10	4	—	Yes	5	2 CT*	Specialty	C
Czech Republic	350	33	10	45	27	—	Yes	5	3 CT	—	c, o
Denmark	140	24	9	110	5	Yes	Yes	5	1.75 CT	—	—
<b>Estonia</b>	<b>40</b>	<b>31</b>	<b>3</b>	<b>10</b>	<b>6</b>	<b>Yes</b>	<b>Yes</b>	<b>4</b>	<b>0.5 CT</b>	<b>Subspecialty</b>	<b>o, w</b>
Finland	50	9	5	5	5	—	—	6	3 CT*	Subspecialty	w
France	700	10	45	80	30	Yes	Yes	5	1 CT	—	—
Germany <sup>a</sup>	767 [26]	9	66 [27]	155 [27]	124 <sup>i</sup> [27]	—	Yes [28]	1 [28]	5* [28]	—	o [28]
Hungary	200	20	8	30	13	Yes	Yes	5	0.5 CT	—	c, o
Ireland	19	4	6	18	7	Yes	Yes	7	3 CT* + 2 or 2 CT* only	—	—
Italy	1500	25	97	100	25	Yes	Yes	4	0.3 CT	—	o, w
Latvia	100	53	UNK	UNK	2	Yes	Yes	5	UNK*	Specialty	c, o, w
Lithuania	123	44	2 <sup>j</sup>	12	2	Yes	Yes	4	2 CT*	Subspecialty	c, o, w
Luxembourg <sup>b</sup>	6	10	1	1	1	No	No	—	—	—	—
Malta <sup>c</sup>	7	14	1	8	1	Yes	Yes	6	2* + 3 CT	Subspecialty	w
Poland	1131	30	130	45	76	—	Yes	5	0.7 CT	—	o, w
Portugal	300	29	18	90	12	Yes	Yes	5	1 CT	—	c, o
Romania	700	36	50	300	6	Yes	Yes	5	2 CT	—	c, o, w
Slovakia	80	15	5	—	3	No	Yes	5	1 CT*	—	o, w
Slovenia	105	50	40	24	5	Yes	Yes	6	1.1 CT	Specialty	c, o
Sweden	800	78	200	30	30	—	Yes	5	1 CT	—	—
Switzerland	300	35	15	40	5	—	Yes	6	3 CT*	Subspecialty	c, o, w
Turkey	1300	16	120	300	90	—	Yes	5	0.5	Subspecialty	o, w
UK	273	4	70	200	40	Yes	Yes	7	3 CT* + 2 or 2 CT* only	Subspecialty	w
Countries in which ID is a subspecialty											
Austria	7	1	2	7	42 <sup>k</sup>	—	Yes	6	2.25 CT	—	o, w
Belgium <sup>d</sup>	100	9	20	40	10	—	Yes	4	3.5*	—	—
Cyprus <sup>e</sup>	10	8	—	—	—	—	Yes	2	5*	Subspecialty	o, w
Greece	70	7	10	20	6	—	Yes	2	5*	Subspecialty	o, w
Iceland <sup>f</sup>	20	50	—	—	—	—	—	3	3 CT*	Subspecialty	—
Israel	235	26	12	235	18	—	Yes	2	4 CT*	Subspecialty	o, w
Netherlands	150	9	20	10	7	—	Yes	2	4*	Specialty	—
Norway	175	33	14	100	4	Yes	Yes	6	4 CT	—	—
Countries in which ID is not a specialty											
Spain <sup>g</sup>	400	9	50	UNK	30	—	No	UNK	—	—	—

Varieeruvus 4 – 53 miljoni elaniku kohta

# Infektsioonhaiguste arstid 2023

												<b>Kokku</b>
<b>Töötavaid infektsioonhaiguste arste (täidetud AK) sh laste IH arstid</b>	3 (2,75)	4 (3,25)	6	4	2	13 (11,1)	4 (3,5)	4 (3,25)	3	0	2 (1,5)	<b>45</b>
<b>Lähema 5 a jooksul pensioniikka jõudvaid arste või juba pensioni eas</b>	0	1	3	1		3	1	2	1	0	1	<b>13</b>
<b>Hetkel täitmata ametikohad</b>	0,25	1,25	1			7	0	0		0	0	<b>9,5</b>
<b>Tegelik täiendavate ametikohtade vajadus lähemaks 5 aastaks</b>	1	1	4	1			2	2	1	1	0,5	<b>13,5</b>

# Õppetunnid edasiseks

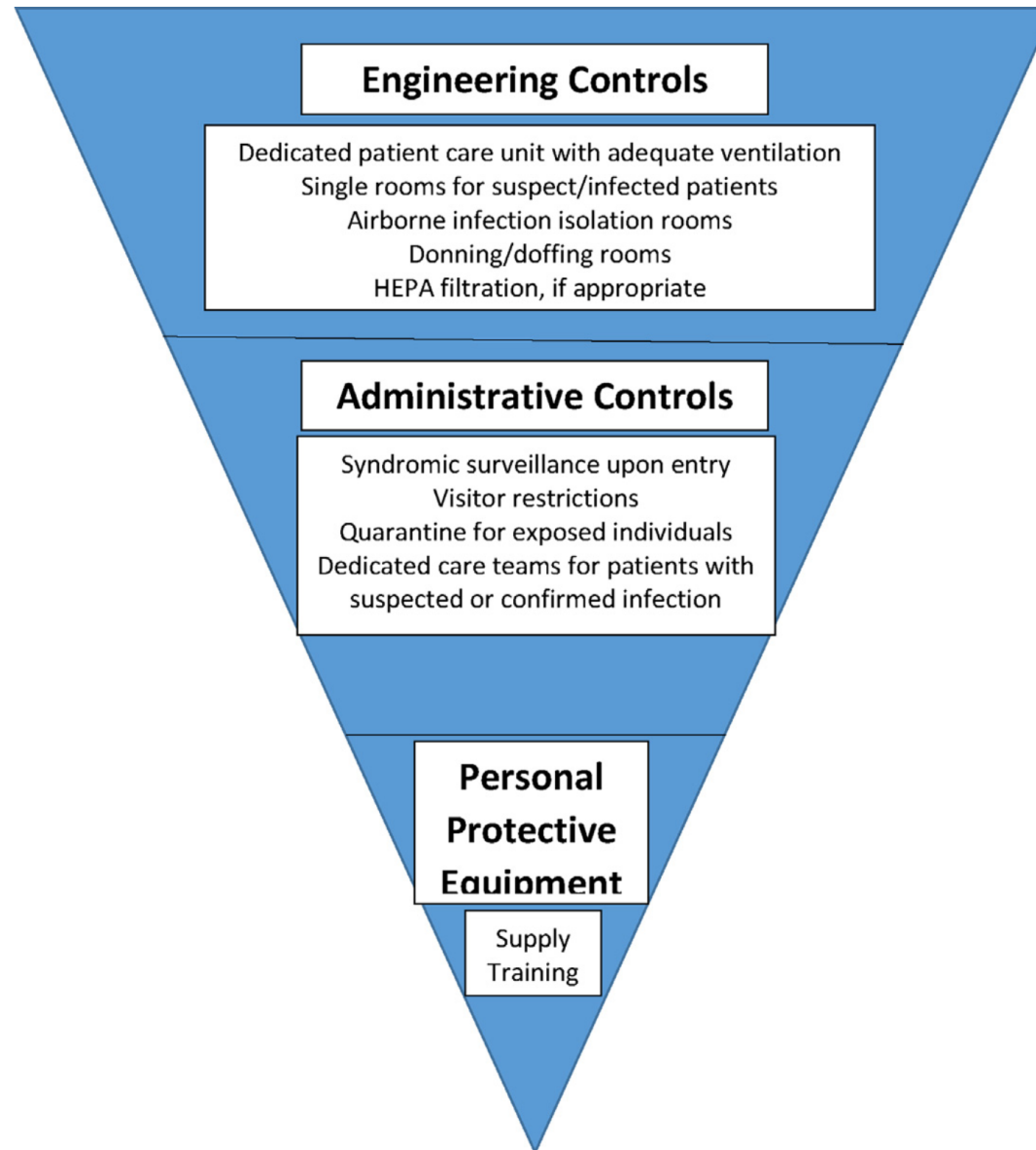
- Residentuuriõppe täiendamine
  - epidemioloogia
  - intensiivravi
  - tiimijuhtimine?
- Vaimsele tervisele suurem tähelepanu
  - töö- ja puhkeaja tasakaal
  - uued põlvakonnad
- Suurem osalus juhiste loomises, ennetustöös, koolituses
- Kommunikatsioon





# Seadusandlus

- Nõuded infektsioonikontrolli tagamiseks
  - teemakohaste seaduste, määruste kaasajastamine,
- Nõuded infrastruktuurile – tervisekeskused, EMOd, haiglad, hooldusasutused, erameditsiin, hambaravi jne
  - haigla liikide nõuded
  - isolatsioonivõimalused
  - ühtlustatud standardid
- Nõuded tööohutusele
  - isikukaitsevahendite olemasolu, koolitus, kvaliteet, vaktsineerimine



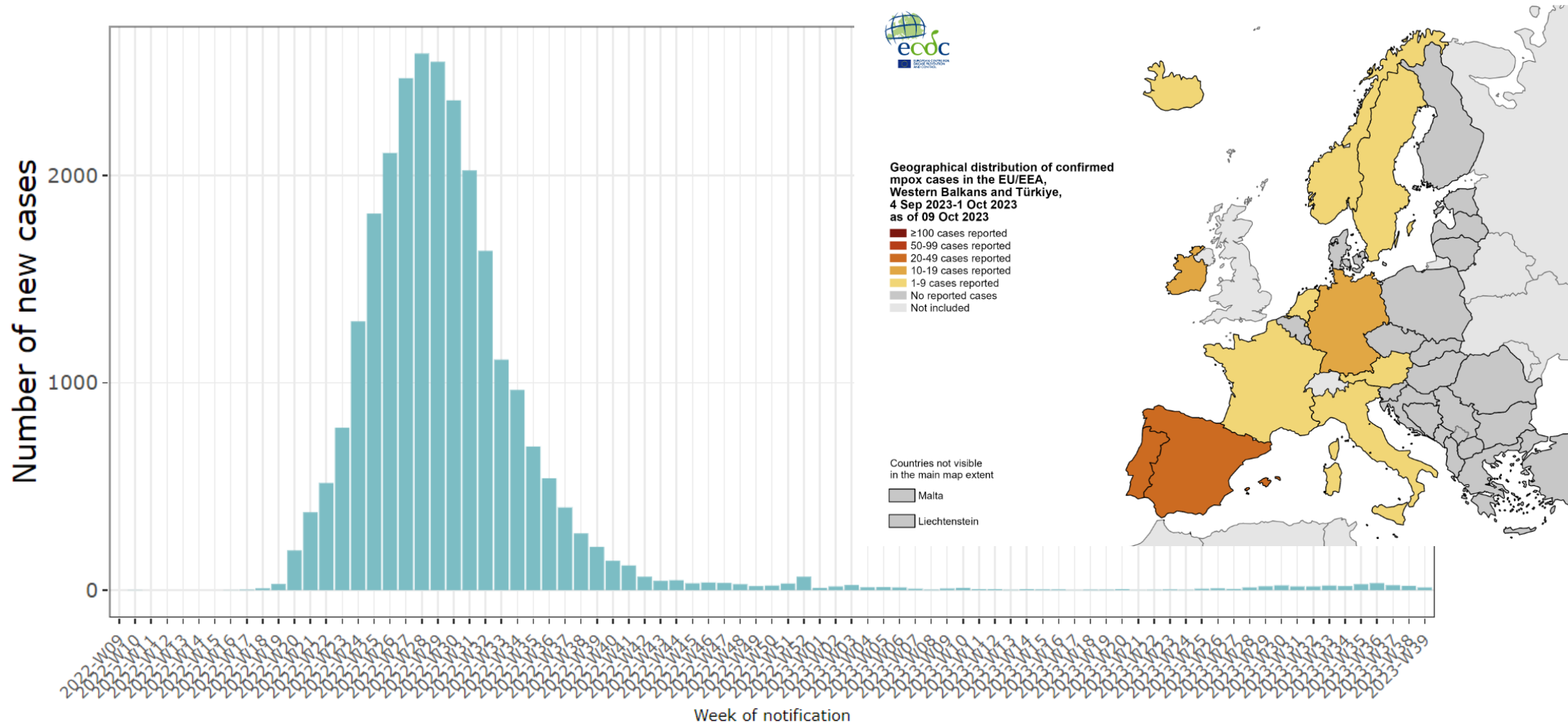
**Fig. 2.** Hierarchy of infection controls and components in pandemic preparedness.

# Infrastruktuur

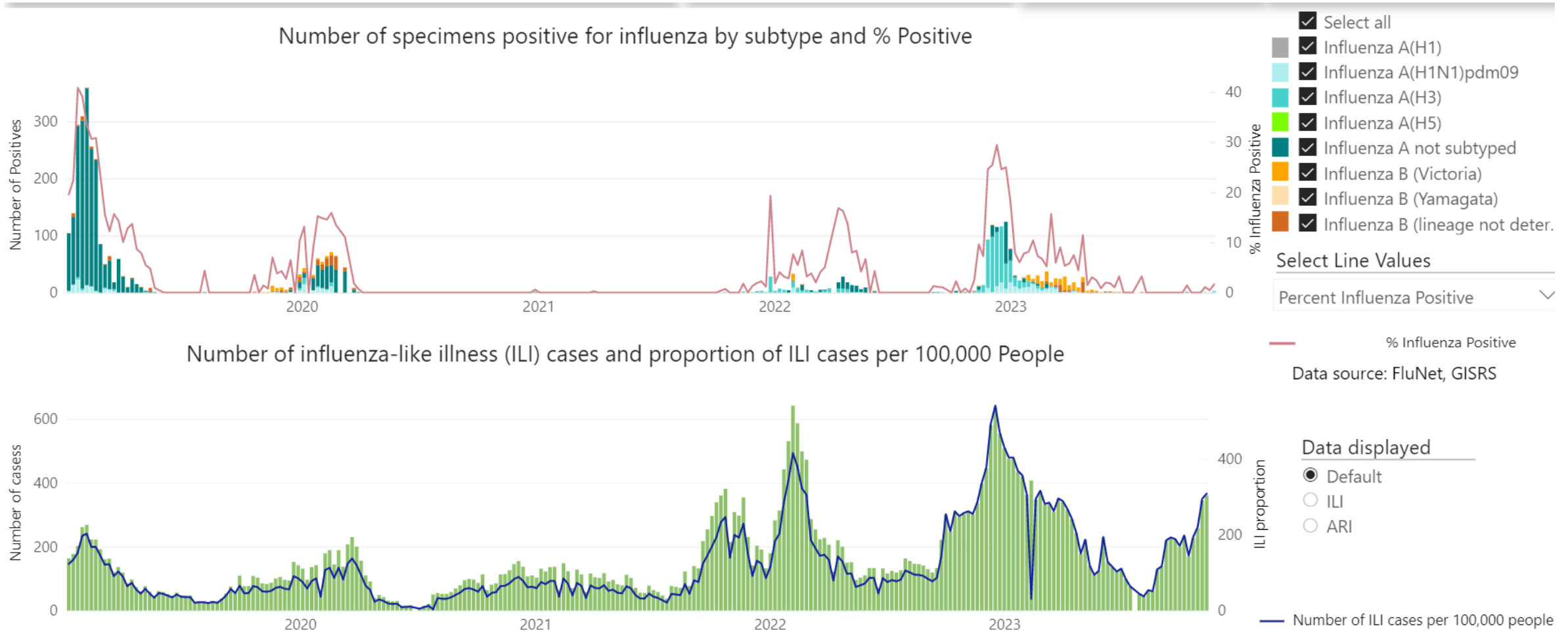
- Isolatsioonivõimaluste suurendamine sh õhklevi
- II ja III astme isolatsioonivõimekusega intensiivravivoodite mahu suurendamine
- Ideaalis 1-kohalised palatid uutes ehitatavates haiglates
- ÄRIga patsientide teekondade eraldamine nt EMOdes, esmatasandil
- Ventilatsioon

# Hea näide – ahvirõuged/mpox

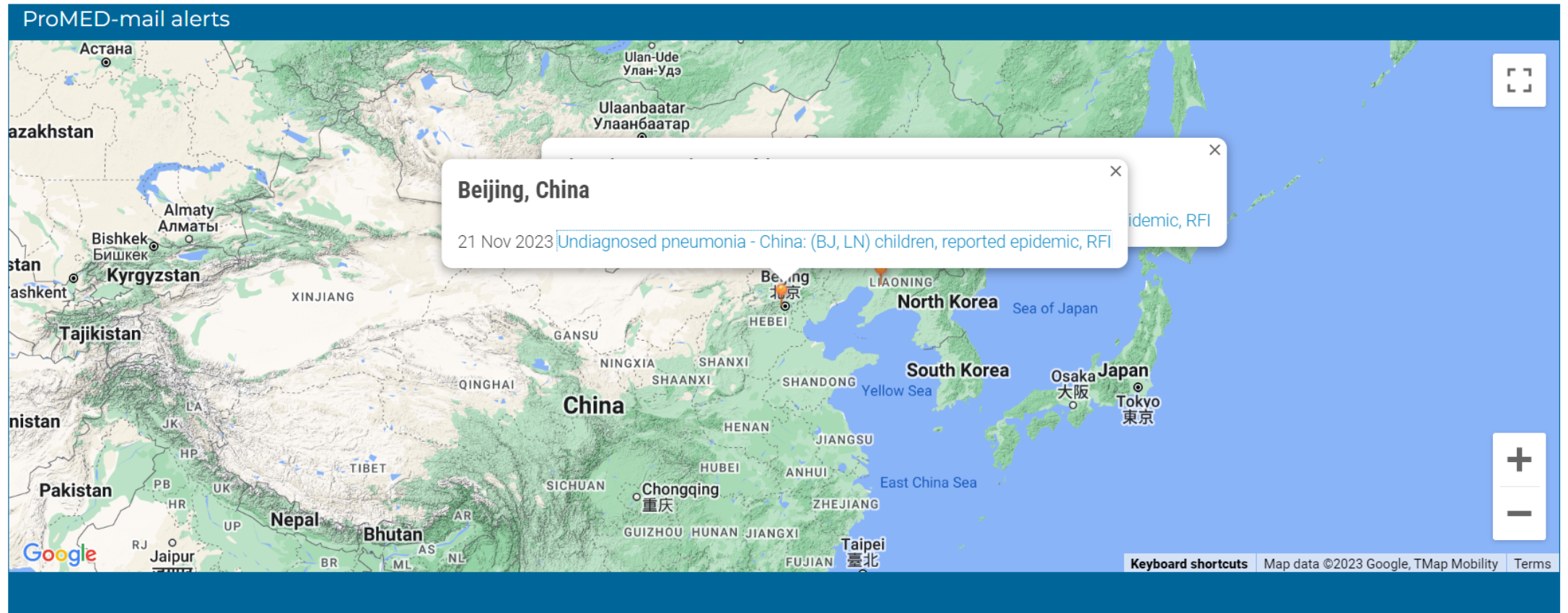
Ülemaailmselt diagnoositud 91788 juhtu  
Euroopas 26229 juhtu  
Eestis 11 juhtu



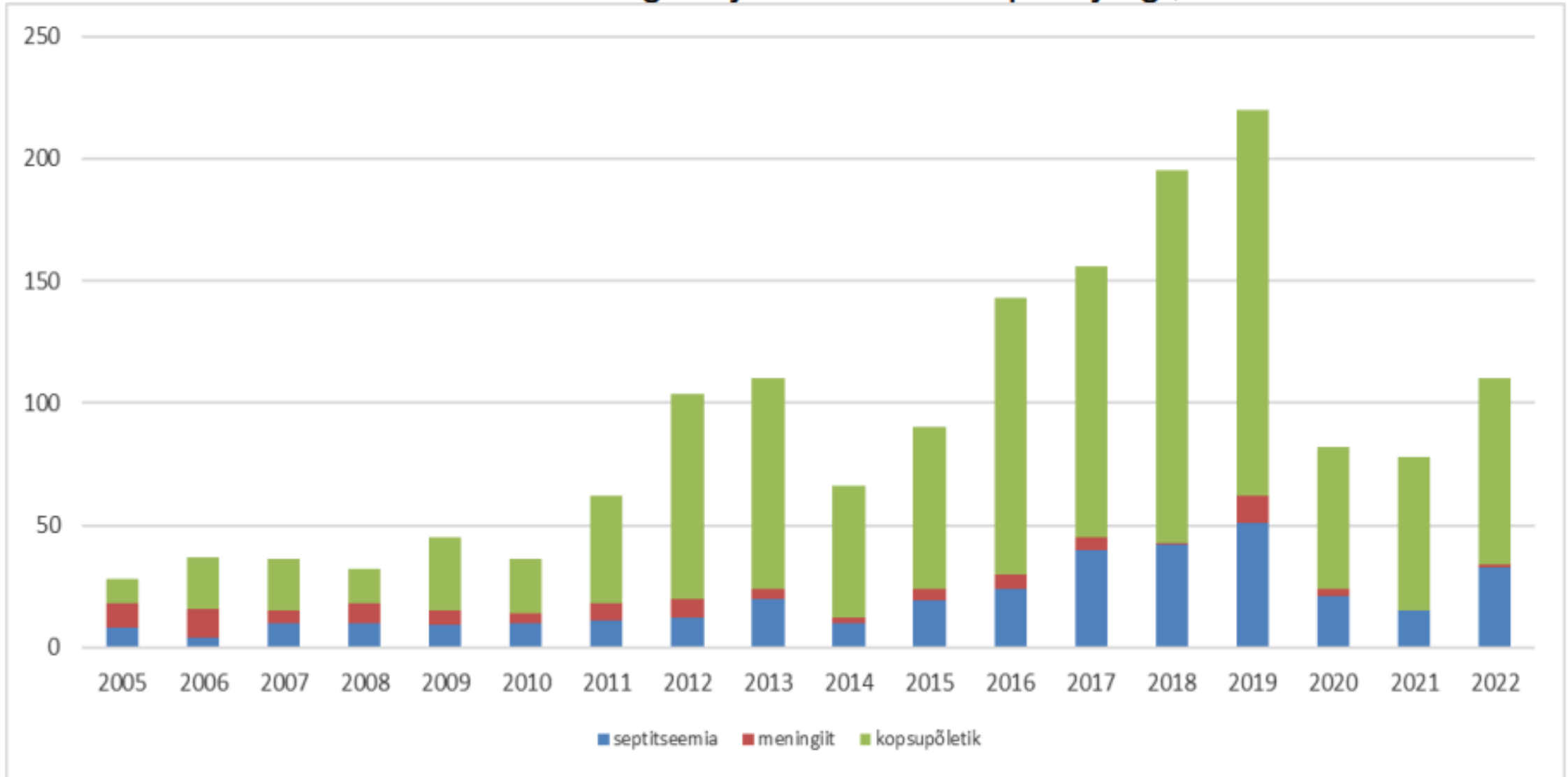
# Haigestumine grippi ja gripitaolistes haigustes 2019 – 2023



# Undiagnosed pneumonia - China: (BJ, LN) children, reported epidemic

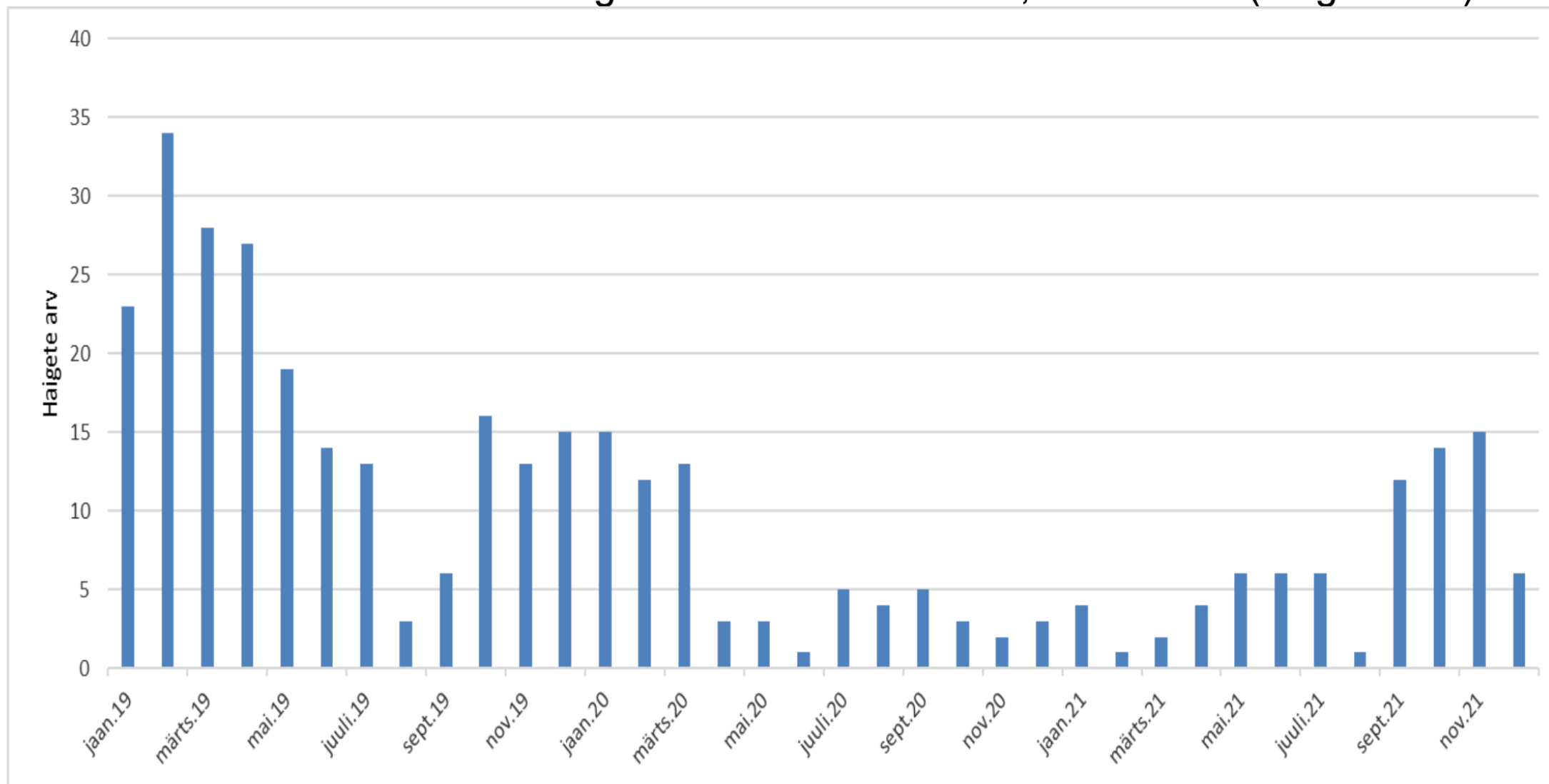


## Pneumokokknakkuse haigete jaotus kliinilise pildi järgi, 2005-2022



Nakkushaiguste esinemine ja immunoprofülaktika Eestis 2022. aastal

# Pneumokokknakkusesse haigestumine kuude lõikes, 2019-2021 (haigete arv)



Nakkushaiguste esinemine ja immunoprofülaktika Eestis 2021. aastal

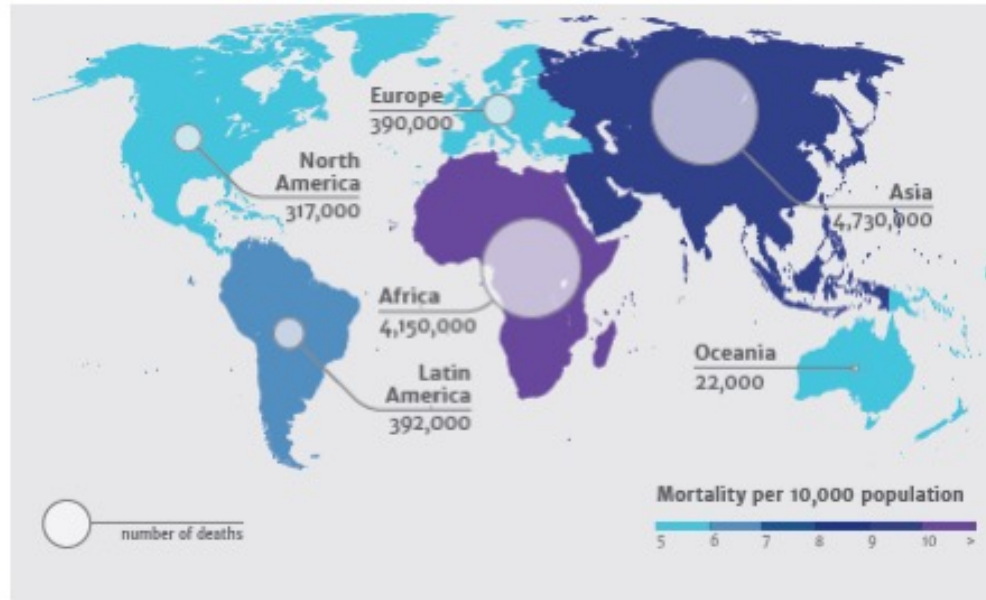


# The Ever Expanding Global Concern of AMR

## Mortality & Economic impact

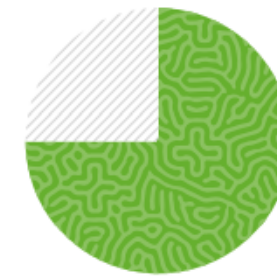
- By 2050, lead to 10 million deaths/year
- Reduction of 2 to 3.5 percent in GDP
- Costing the world up to \$100 trillion

Deaths attributable to AMR every year by 2050



33 000 surma-juhtumit

Igal aastal sureb 33 000 inimest infektsiooni tõttu, mille on põhjustanud antibiootikumide suhtes resistentne bakter. Seda on ligikaudu sama palju kui 100 keskmise suurusega reisilennukis reisijaid kokku.



75%

tervishoiuteenuste osutamise seotud nakkusi

75% antibiootikumiresistentsete bakterite põhjustatud koormusest Euroopas on põhjustatud tervishoiuteenuste osutamise seotud nakkustest. Seda saaks minimeerida infektsioonide ennetamise ja tõrje piisavate meetmetega, samuti antibiootikumikasutuse piiramisega tervishoiuasutustes.

5 J. O'Neil, 2014. *Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations.*

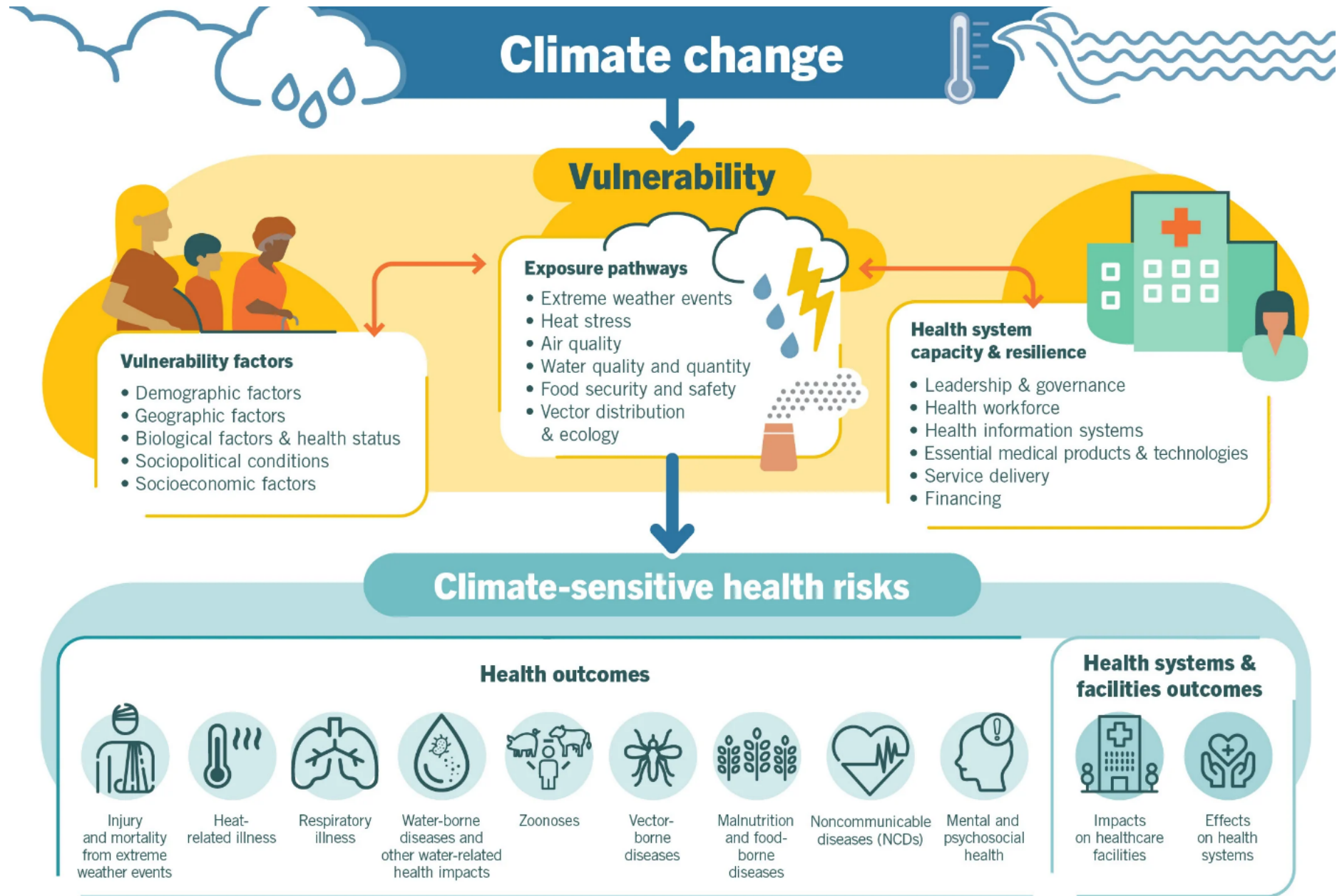


Target achieved Progress Regress


<p><b>Reduce by 20% the total consumption of antibiotics in humans</b> As defined daily doses (DDD) per 1 000 inhabitants per day</p>	2019 Baseline	19.9	-
	2022	19.4	-2.5%
	2030 TARGET	15.9	-20%
<p><b>At least 65% of the total consumption of antibiotics in humans belongs to the 'Access' group of antibiotics</b> As defined in the AWaRe classification of the WHO</p> <p><small>*Population-weighted mean % consumption in 'Access' group. **Percentage point difference from 2019.</small></p>	2019 Baseline	61.1%*	-
	2022	59.8%*	-1.3%**
	2030 TARGET	65%	+3.9%**
<p><b>Reduce by 15% the total incidence of bloodstream infections with meticillin-resistant <i>Staphylococcus aureus</i> (MRSA)</b> Number per 100 000 population</p>	2019 Baseline	5.6	-
	2022	4.9	-12.2%
	2030 TARGET	4.8	-15%
<p><b>Reduce by 10% the total incidence of bloodstream infections with third generation cephalosporin-resistant <i>Escherichia coli</i></b> Number per 100 000 population</p>	2019 Baseline	10.4	-
	2022	8.7	-16.8%
	2030 TARGET	9.4	-10%
<p><b>Reduce by 5% the total incidence of bloodstream infections with carbapenem-resistant <i>Klebsiella pneumoniae</i></b> Number per 100 000 population</p>	2019 Baseline	2.2	-
	2022	3.3	+49.7%
	2030 TARGET	2.1	-5%

<p><b>Reduce by 3% the total consumption of antibiotics in humans</b> Defined daily doses (DDDs) per 1 000 inhabitants per day</p>	2019 baseline	11.8	-
	2022	12.4	+5.2%
	2030 TARGET	11.4	-3%
<p><b>At least 65% of the total consumption of antibiotics in humans belongs to the 'Access' group of antibiotics</b> As defined in the AWaRe classification of the WHO</p> <p><small>*Percentage point difference from 2019</small></p>	2019 baseline	61.3%	-
	2022	64%	+2.7%*
	2030 TARGET	65%	+3.7%*
<p><b>Reduce by 3% the total incidence of bloodstream infections with meticillin-resistant <i>Staphylococcus aureus</i> (MRSA)</b> Number per 100 000 population</p>	2019 baseline	0.83	-
	2022	0.68	-18.6%
	2030 TARGET	0.81	-3%
<p><b>Reduce by 10% the total incidence of bloodstream infections with third-generation cephalosporin-resistant <i>Escherichia coli</i></b> Number per 100 000 population</p>	2019 baseline	7.9	-
	2022	8.9	+11.8%
	2030 TARGET	7.1	-10%
<p><b>Maintain at baseline level the total incidence of bloodstream infections with carbapenem-resistant <i>Klebsiella pneumoniae</i></b> Number per 100 000 population</p> <p><small>*For baseline 0.00 it was not possible to calculate percentage of increase</small></p>	2019 baseline	0.00	-
	2022	0.23	NA*
	2030 TARGET	0.00	-







The Preface to  
  
THE  
P R E F A C E  
T O M.  
Michael Nostradamus  
H I S  
P R O P H E C I E S,  
At Calixtus Nostradamus Filium esse  
& Falsum.

**L**ittle late coming, Calixtus Nostradamus, my Son, hath  
caused me to bestow a great deal of time in con-  
sidering and meditating, that I might have  
Memorial of me after my death, as the common  
benefit of Mankind, concerning the things which the  
Divine Elixirs hath revealed to me by Admonitions  
of Revelations; and how it hath pleased the immortal God, that  
these are come here into this World, and such are they that  
cannot see but few, but the Mankind are incapable to receive  
into their weak understanding, what I am forced to deliver of some  
way, that it is not possible to have them in Writing, what might  
and

Mr. Michael Nostradamus Prophecies  
be fulfilled by the unity of states, for the Christian world of  
which predictions shall be made up to my death, considering also  
that the events are distinctly expressed, and that all is governed by  
the power of God, who subjected to me by a Banishment here in  
Languedoc, but by Admonitions of Revelations, that manner  
I have often professed in my former prophecies: And because  
I have often foretold long before what hath afterwards  
come to pass, and in particular Prophecies, which have been  
fulfilled since by Divine Vision and Revelation, being willing  
to hold me good by reason of the same, and ready to be questioned  
upon the same at the Courts, and to give therein Witness, according  
to the Kingdoms, Cities, and Regions that be in Christendom, and  
that, that I should relate what hath happened hereafter, that of  
the present Kings, Kings, Princes, and States, would lead to the  
opening with their hearts, that they would conclude that which  
I have here shall find and know to be true; considering also the  
lying of our Nations, which foretold that number as certain  
rather of certain things, which hath been the mark that  
I have withdrawn my tongue from the Veil, and my Pen from  
Paper: But afterwards I was willing for the common good  
to lay my self to such and certain business, describing the same  
Events, chiefly the most evident, and such which I believe (what  
ever become amongst themselves) would see all of the things, all  
under such signs were they Prophecies, for although, Admonitions  
have a reputation of prophecies, in particular of Revelations  
which as comes of themselves, and the Prophecies are generally of  
the immortal God and good Angels, have received the Spirit of  
Verities, by which they have foretold things and several things, as  
for making a perfect picture here, where power and goodness to be  
given to be known, that though they are but men, nevertheless  
by the Mouth of our good Angels to the Angels, the true and  
Prophecies given down to us, as it happens by the Mouth  
of the Sea, which will their influence both to Christendom and the  
Christianity besides, as that in what are written, which are any  
thing by our special knowledge, of the favour of God and Calixtus  
Nostradamus, that we are of no more use to our Nations, but  
that, although there is a great number of prophecies, according  
to the Mankind will reveal by themselves, such as understanding  
some things of the future, according to the Jewish Prophecies, as  
it hath happened in former times, that a certain power will receive  
and

Paul, Clinical Microbiology and Infection 2013

# Aitäh!

- Vivika Adamson
- Piret Mitt
- Kai Zilmer
- Eva Luide
- Kristel Pärt

# Täna tähelepanu eest!

Konverentsi korraldamist rahastatakse Euroopa Liidu COVID-19 pandeemia reageerimise raames

Konverentsi korraldab Tartu Ülikool koostöös Sotsiaalministeeriumiga



SOTSIAALMINISTEERIUM



TARTU  
ÜLIKOOL



Euroopa Liit  
Euroopa  
Regionaalarengu Fond



Eesti  
tuleviku heaks