



Rijksinstituut voor Volksgezondheid en Milieu
Ministerie van Volksgezondheid, Welzijn en Sport



Impact analysis multitrauma target for ambulance services

CHOIR Seminar EMS Enschede
December 8th 2023

CHOIR Seminar EMS Enschede | Dec-2023

1



The RIVM (National Institute of Public Health)






Living in a safe, clean, healthy environment

RIVM advises the government on how we can keep our living environment safe, clean and healthy. We also share knowledge about smart solutions for a safe and sustainable environment.

- We regularly monitor the quality of air, water and soil.
- We perform on-site measurements after an accident or disaster in which hazardous substances may have been released.
- We research various forms of radiation, including emissions from radioactive chemicals, light sources, high-voltage power lines and mobile phones.

Preventing and controlling infectious diseases

RIVM collects, analyses and interprets data on infectious diseases by conducting field and laboratory research. In doing so, we prevent and control infectious diseases. To that end, we work with organisations in the Netherlands and abroad.

- RIVM organises the National Immunisation Programme. This programme protects citizens against measles, mumps, whooping cough and diphtheria.
- RIVM assists the Municipal Public Health Services (GGZ) in controlling local or regional outbreaks of diseases.
- In the event of a major outbreak, we coordinate efforts to control the disease. Examples include the coronavirus SARS-CoV-2, Q fever, foodborne infections, Ebola, and

Good healthcare and a healthy lifestyle

RIVM investigates what is needed for good healthcare and a healthy lifestyle. We also assess which national and local health programmes are most effective. One of our important tasks is genetic screening: checking babies for possible diseases, both during pregnancy and right after birth. We also have population screening programmes for prevention or early detection of diseases such as colorectal cancer, breast cancer and cervical cancer.

- How safe are medical products, medicines and food?
- What are the health risks of smoking, alcohol or obesity?
- How much salt do Dutch people use in their food?


CHOIR Seminar EMS Enschede | Dec-2023

2



EMS in the Netherlands


Veiligheidsregio's in Nederland



- 13 (will be 10) 112-call centers
- Healthcare coördination centers (will be 10)
- 25 Ambulance services, 225 stations 24/7
- 105 Out-of-office GP services (53 HDS)
- 80 Hospitals 24/7 ED + 3 day-evening
- 10 Traumacenters
- 47 Emergency mental care locations ('crisis-GGZ')


CHOIR Seminar EMS Enschede | Dec-2023

3



EMS in the Netherlands

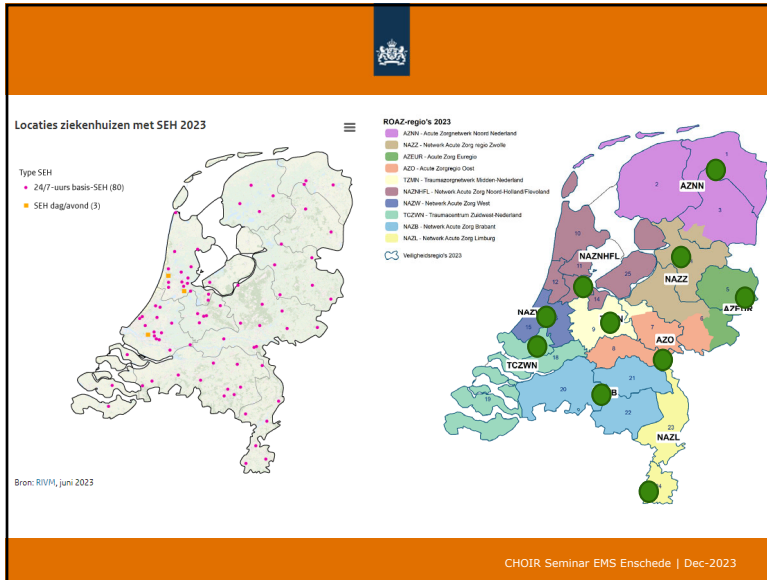
NOAZ-regio's 2023



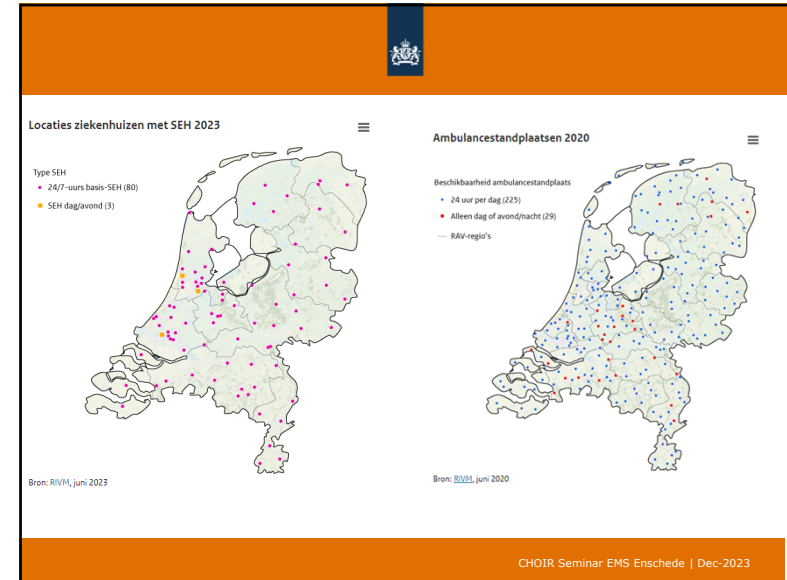
- 13 (will be 10) 112-call centers
- Healthcare coördination centers (will be 10)
- 25 Ambulance services
- 105 Out-of-office GP services (53 HDS)
- 80 Hospitals 24/7 ED
- 10 Traumacenters
- 47 Emergency mental care locations ('crisis-GGZ')

CHOIR Seminar EMS Enschede | Dec-2023

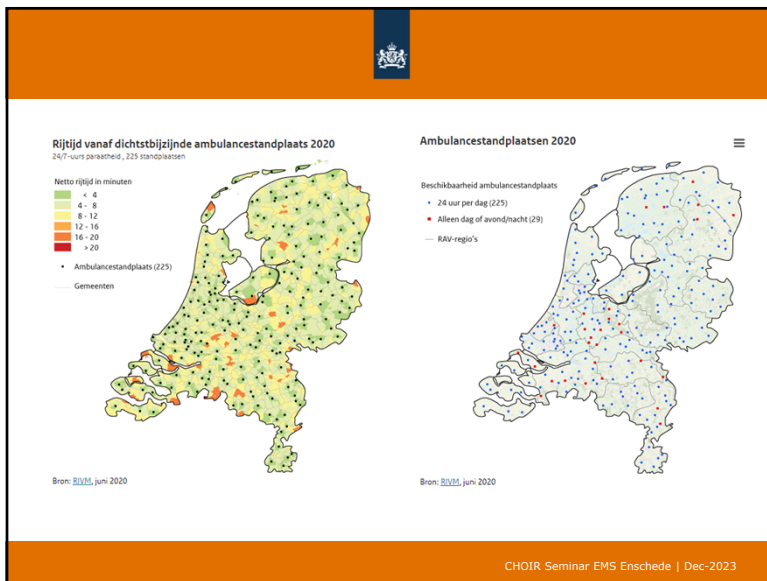
4



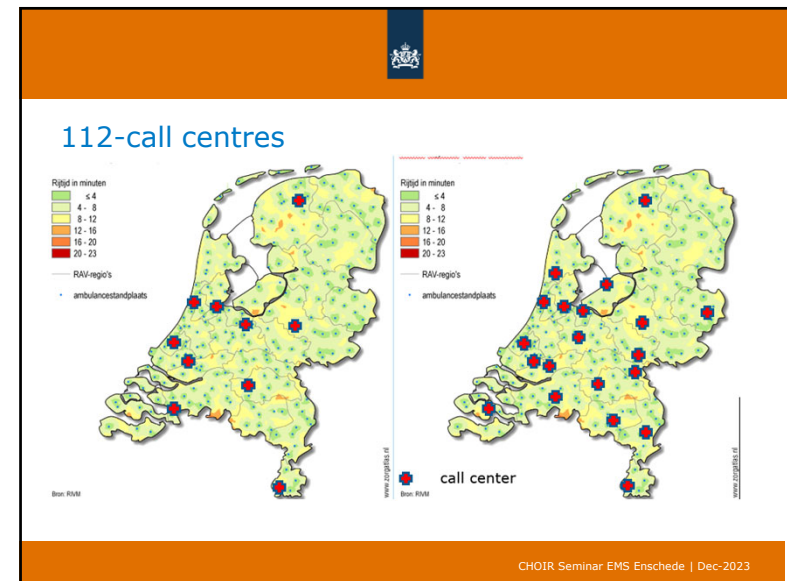
5



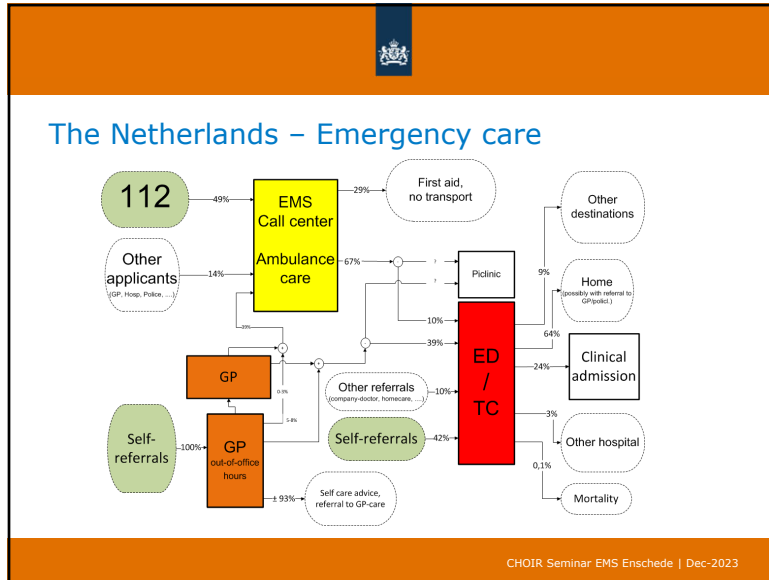
6



7



8



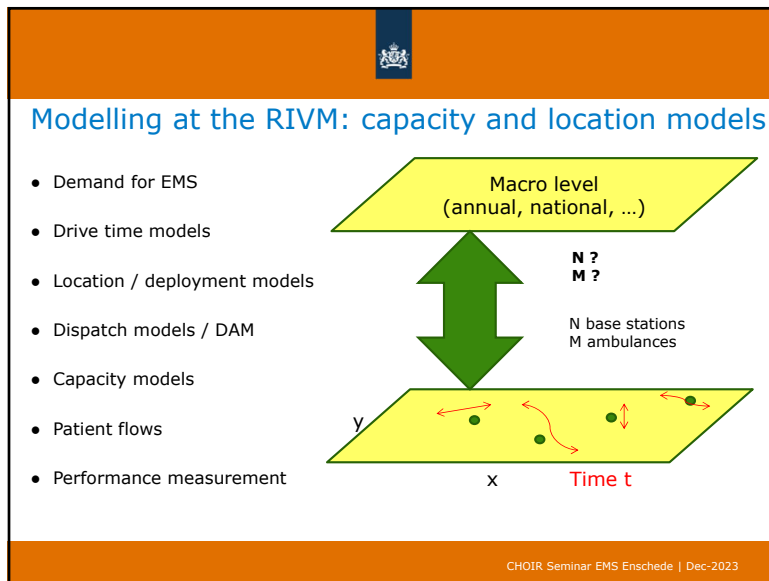
9

The Netherlands – Emergency care

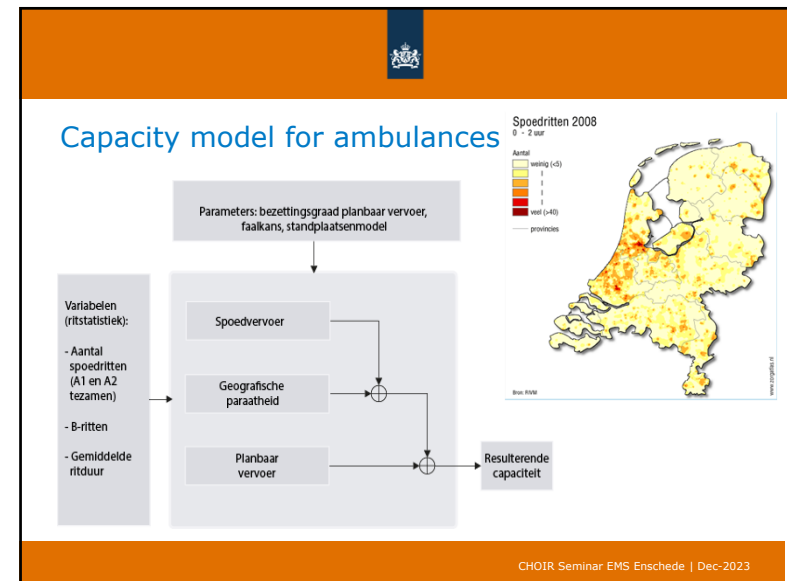
Type	To be carried out by	Examples of activities
Basic Life Support basic reanimation with simple techniques	Bystanders, first responders, ambulance nurse, GP, A & E staff	Chest compressions, mouth-to-mouth resuscitation, using AED
Advanced Life Support extensive reanimation with complex techniques	Ambulance-nurse, MMT-doctor SEH-doctor, GP	Intubation, defibrillation, giving injections
Advanced trauma/cardiac/pediatric life support	MMT-doctor, physician hospital	Specific interventions: neurosurgical procedures, angioplasty

CHOIR Seminar EMS Enschede | Dec-2023


10



11



12



Ambulance call center model


Develop a capacity model for ambulance call centers

Difficulties:

- merging from 25 (2010) to 16 (2022) to 10 (2023) locations
- co-location with police and firebrigade
- development towards health care coordination-centres
- complex process and tasks

CHOIR Seminar EMS Enschede | Dec-2023

13



Ambulance call centres



Call takers are **nurses**

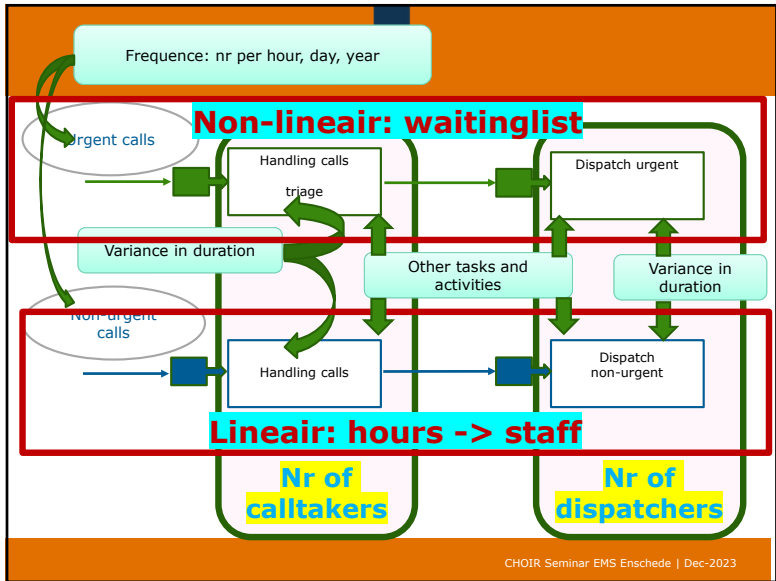
Dispatchers not necessary

2 triage systems: AMPDS / NTS


Co-located
Ambulance + Police + Firebrigade

CHOIR Seminar EMS Enschede | Dec-2023

14



15



Impact analysis multitrauma

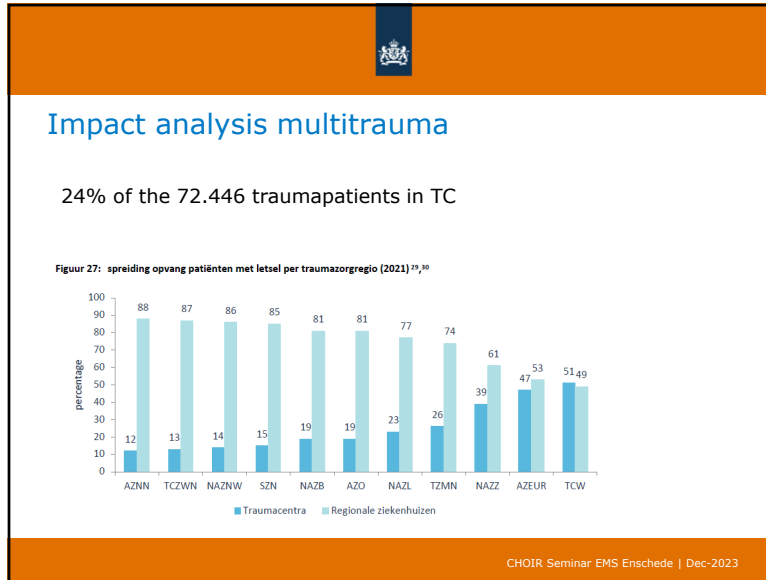
Tabel 2: aantal geregistreerde patiënten met letsel, ziekenhuizen met een SEH en inwoners per traumazorgregio 2021¹²

Regio	Inwoners	Aantal geregistreerde patiënten met letsel LTR	Aantal ziekenhuizen met een SEH	Incidentie klinische patiënten met letsel per 10.000 inwoners
Acute Zorg Euregio (AZEUR)	763.545	3.845	3	50
Traumazorgnetwerk Midden-Nederland (TZMN)	1.448.595	4.890	5	34
SpoedZorgNet (SZN)	1.431.720	5.474	9	38
Netwerk Acute Zorg regio Zwolle (NAZZ)	1.132.255	5.763	7	51
Netwerk Acute Zorg Limburg (NAZL)	1.118.215	5.975	6	53
Acute Zorgregio Oost (AZO)	1.330.460	6.451	6	48
Netwerk Acute Zorg Noordwest (NAZNW)	1.912.030	6.750	9	35
Traumacentrum West (TCW)	1.953.160	7.248	7	37
Acute Zorgnetwerk Noord Nederland (AZNN)	1.682.425	7.356	9	44
Traumacentrum Zuidwest-Nederland (TCZWN)	2.222.915	9.331	12	42
Netwerk Acute Zorg Brabant (NAZB)	2.592.500	9.363	11	36
Totaal Nederland	17.587.820	72.446	84	41

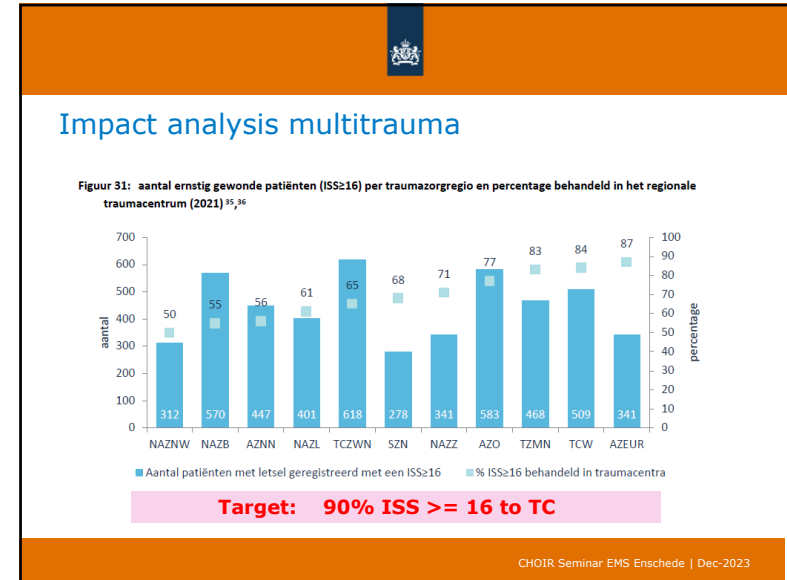
In 2021: 6% ISS >= 16 (4.868 patients)

CHOIR Seminar EMS Enschede | Dec-2023

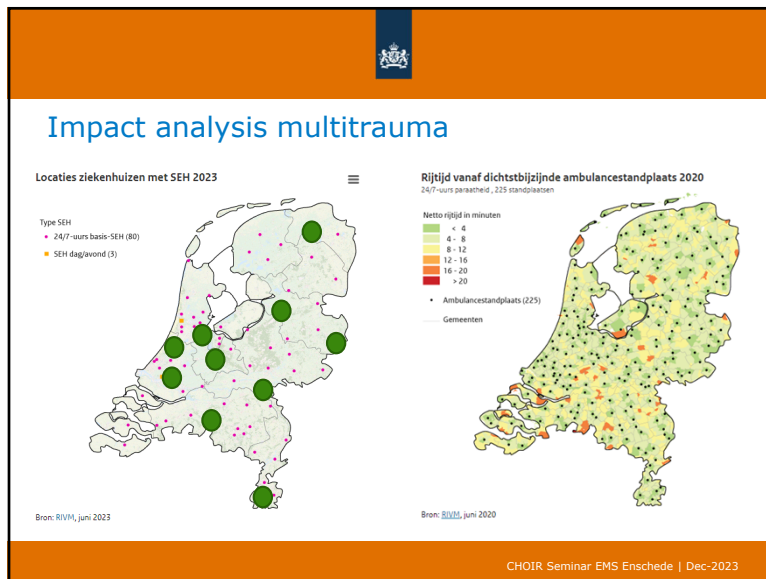
16



17



18



19

Impact analysis multitrauma

Impact for Ambulance service (RAV):

What is the risk

Extra ambulances needed?

Data: Urgent ambulance services over 2017-2022

Identify trauma incidents ISS >= 16 (at record-level)

Method: Estimate the extra drive time and workload

CHOIR Seminar EMS Enschede | Dec-2023

20



Impact analysis multitrauma

Per ambulance station catchment area, per weekday per hour:

- # urgent incidents
- # ambulances available
- # workload

Three situations:

1. Current situation
2. 100% Multitrauma to TC
3. Also # ISS 10-16 to TC

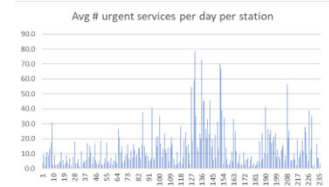
Impact for Ambulance service (RAV):

What is the risk

Extra ambulances needed?



Impact analysis multitrauma



	per year	per day	per hour
Number of urgent services (2022)	1162045	3184	133
A1	703991	1929	80
A2	458054	1255	52
Number of trauma (2021)	72446	198	8.3
Number of multitrauma (ISS>=16, 2021)	4868	13	0.6
per station			
min	134	0.4 Schiermonnikoog	
max	28715	78.7 Amsterdam	



Thank you for your attention

