

MASTERTHESIS
RISK FACTORS ASSOCIATED WITH MORTALITY
DURING EMS CARE: A CASE-CONTROL STUDY
(IN VINNYTSIA REGION)

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RELEVANCE

Emergency medical services (EMS) are **an essential component** of the health care system.

The Ukrainian EMS faces many **challenges** with regards to the quality of care it provides.

Therefore, the Government initiated a set of policies to reform the EMS system.

However, a limited amount of evidence exists on the performance and outcomes of the current EMS system.

Hence, it is critical to ensure that such evidence is available to support the efforts of decision-makers, so as to improve the delivery of EMS in Ukraine.

AIM & TASKS

This study aimed to evaluate the Ukrainian EMS system, to provide evidence-based recommendations for its improvement.

Tasks:

1. Analyze Ukrainian EMS system using WHO's Health System Building Blocks
2. Conduct a case-control study of risk factors associated with mortality in the prehospital stage of the EMS in Ukraine
3. Compare EMS care delivery in Ukraine with other countries
4. Develop a set of recommendations to decrease mortality in the prehospital stage of the emergency care system in Ukraine

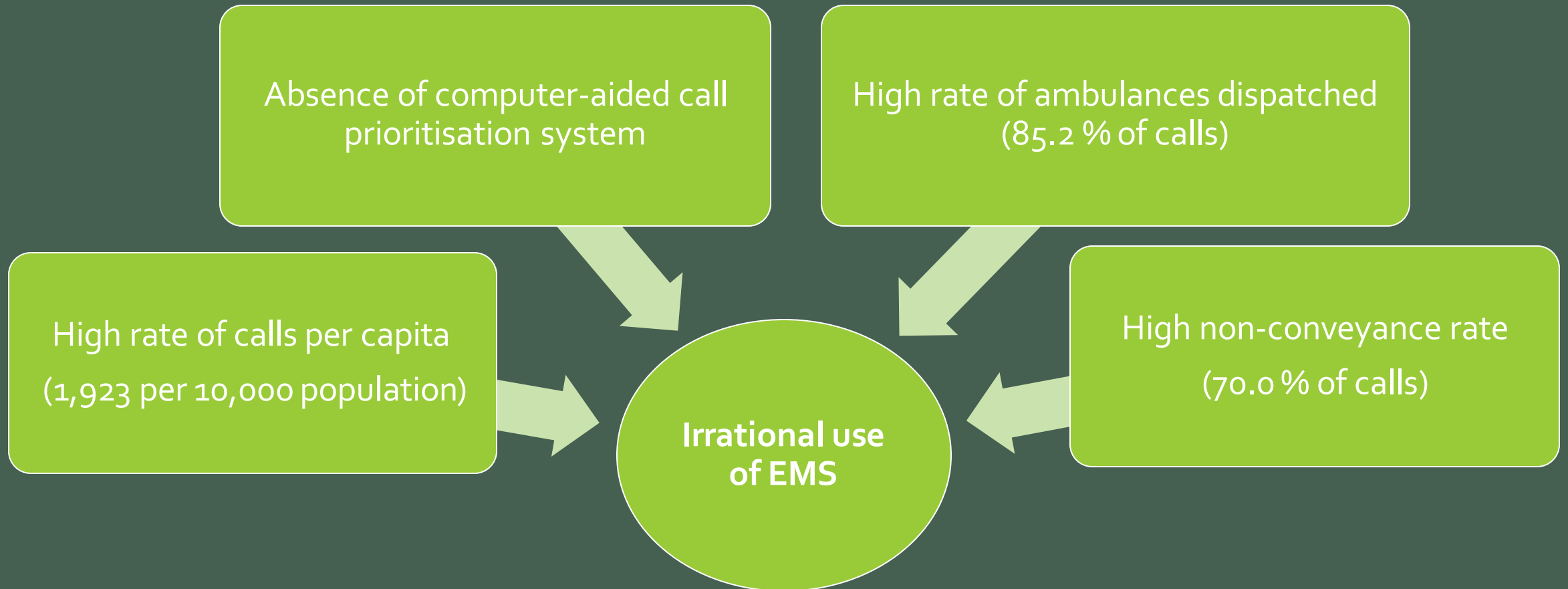
METHODS

Ukrainian EMS system was assessed by conducting a desktop review using the WHO's 'Six Building Blocks'



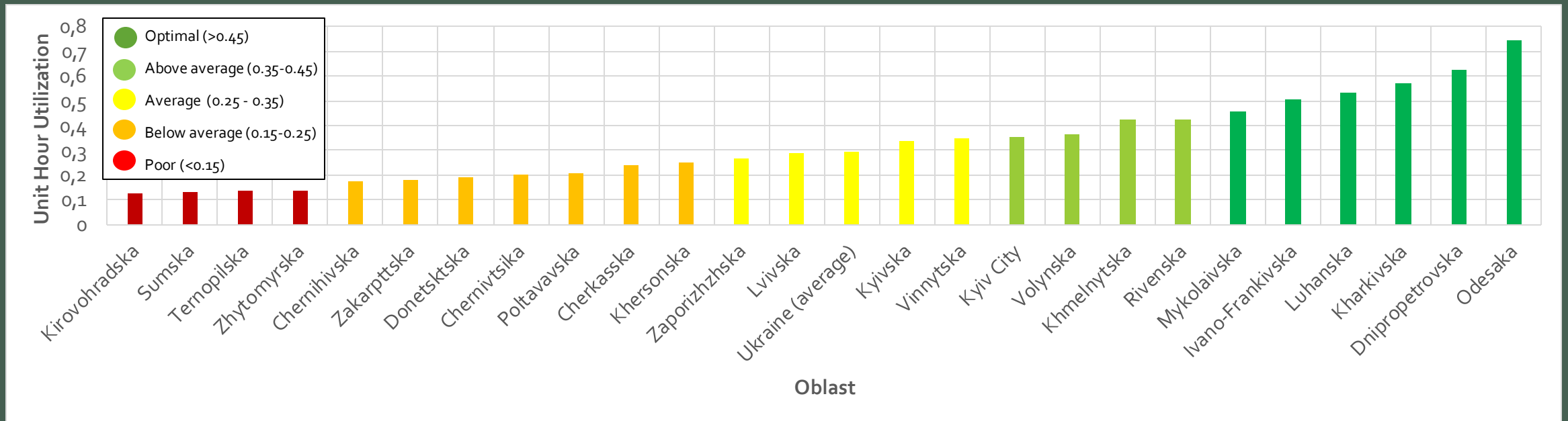
Matched case-control study was used to determine risk factors associated with death during prehospital care

TASK 1: EMS BUILDING BLOCKS



TASK 1: EMS BUILDING BLOCKS (CONT.)

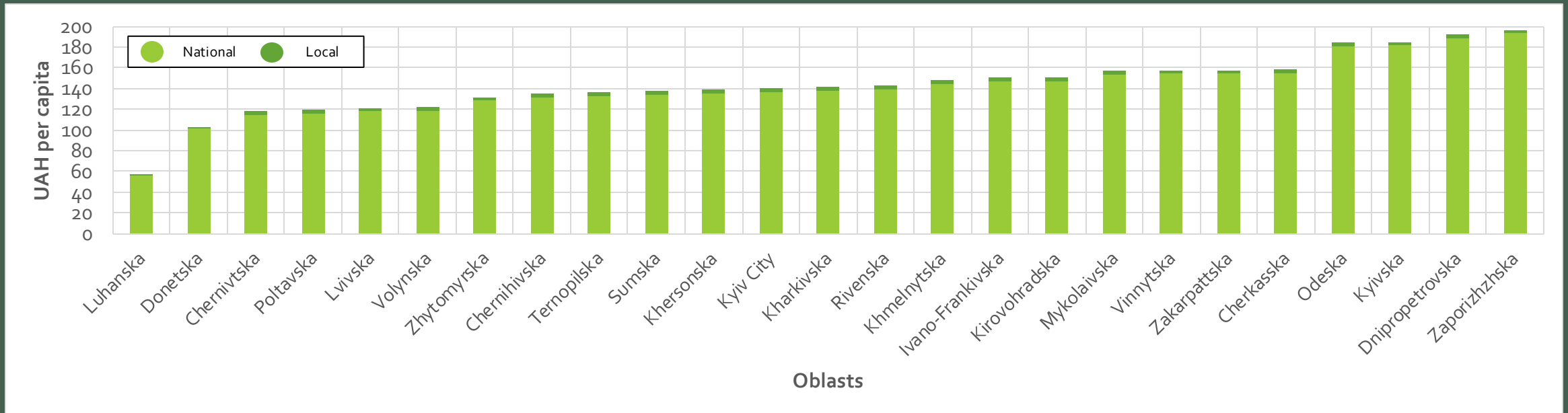
Unit Hour Utilisation of EMS fleet by oblast



Variation in the unit hour utilization of EMS fleets

TASK 1: EMS BUILDING BLOCKS (CONT.)

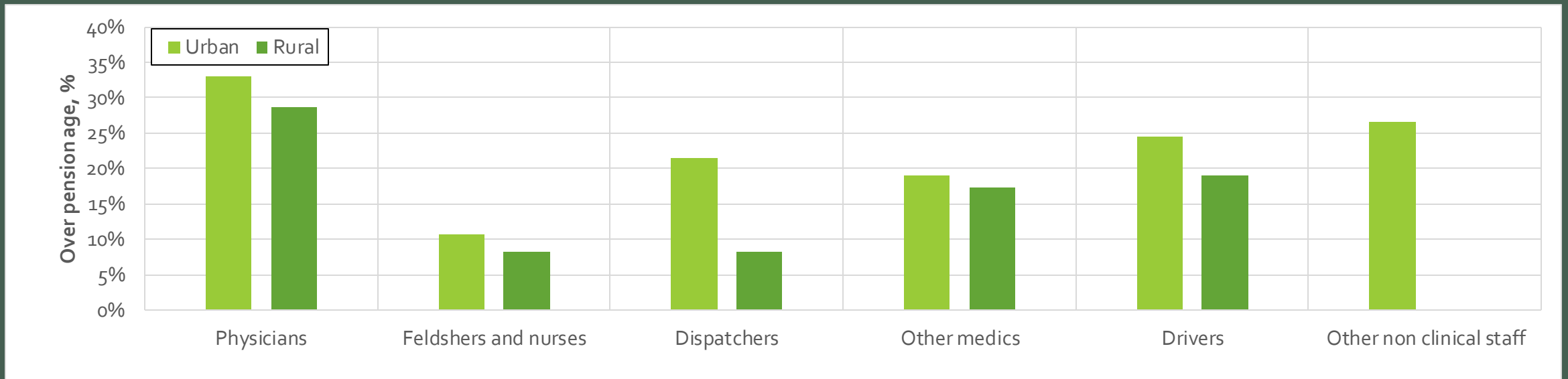
Per capita spendings on EMS by oblast in 2018



Inequalities in state funding of EMS centers between oblasts

TASK 1: EMS BUILDING BLOCKS (CONT.)

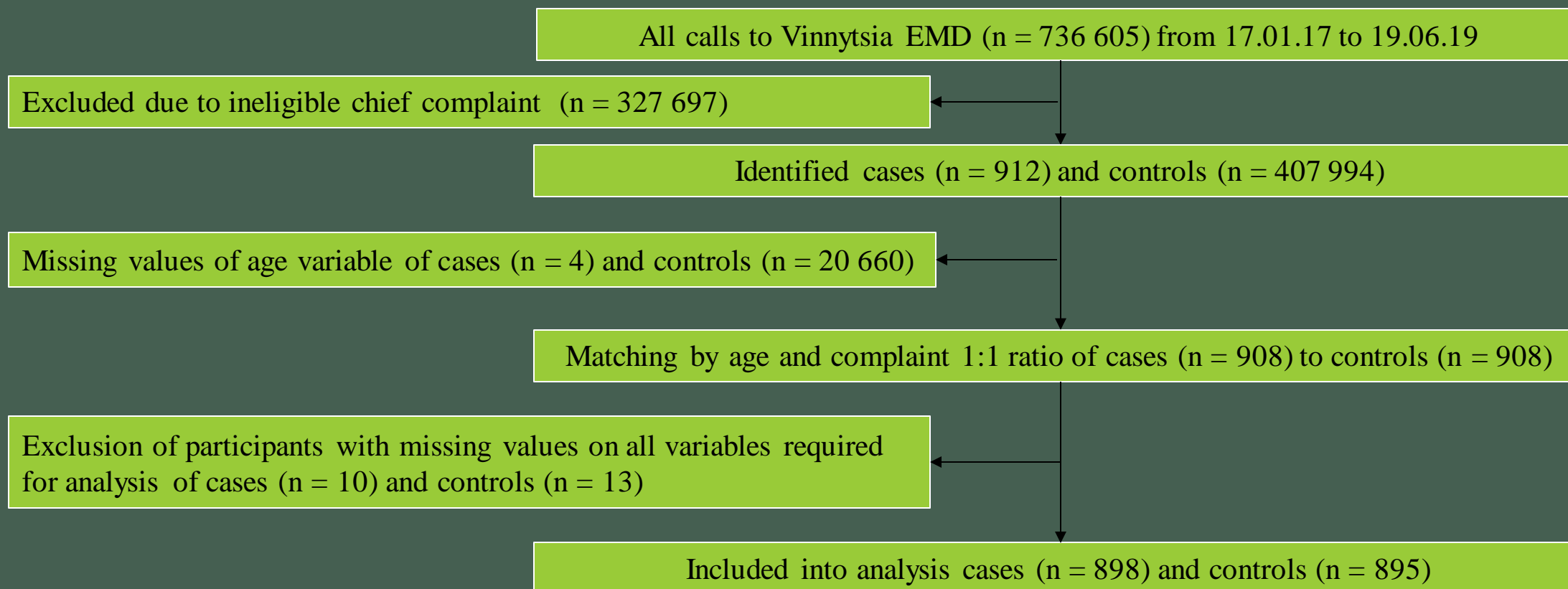
Percentage of personnel over pension age by profession and urban/rural



Overaged and unequally distributed workforce

TASK 2: PREHOSPITAL MORTALITY RISK FACTORS

Inclusion of participants to case-control study



TASK 2: PREHOSPITAL MORTALITY RISK FACTORS (CONT.)

Frequency distribution of exposures between cases and controls

Patient's sex (p = <0.001, Chi-Square)	Response urgency (p = <0.001, Chi-Square)	Place of the incident (p = <0.001, Chi-Square)	Response time (p = <0.001, Mann-Whitney U)
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Odds ratio and 95 % confidence intervals

Incident in public place (OR 2.417; CI 1.667 - 3.505; p = <0.001)	Response time (OR 0.982; CI 0.977 - 0.987; p = <0.001)	Patient's sex (male) (OR 1.909; CI 1.578 - 2.309; p = <0.001)	Response urgency (OR 1.566; CI 1.215 - 2.019; p = <0.001)
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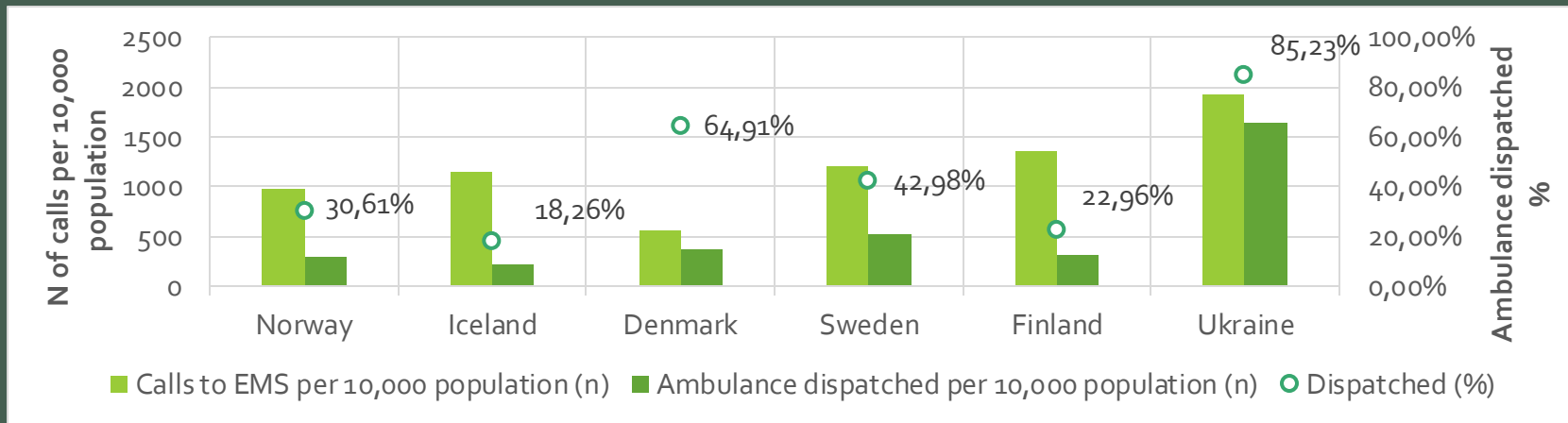


Adjusted odds ratio and 95 % confidence intervals

Incident in public place (AOR 2.658; CI 1.661 - 4.254; p = <0.001)	Response time (AOR 0.981; CI 0.976 - 0.986; p = <0.001)	Patient's sex (male) (AOR 2.063; CI 1.672 - 2.546; p = <0.001)	Patient's age (AOR 0.990; CI 0.983 - 0.997; p = 0.004)
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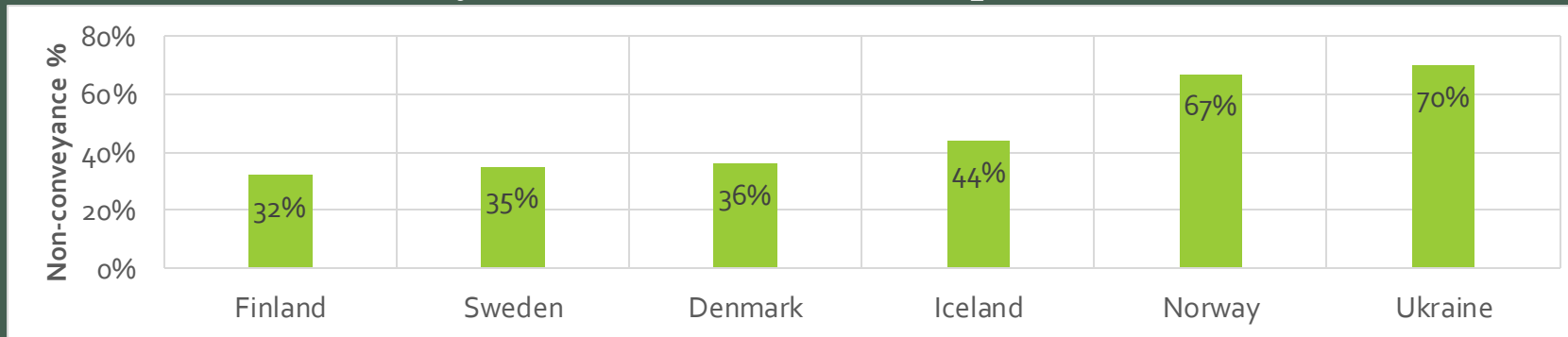
TASK 3: COMPARISON OF THE UKRAINIAN EMS WITH OTHER COUNTRIES

Calls and ambulance responses per 10,000 pop in Ukraine compared to other countries

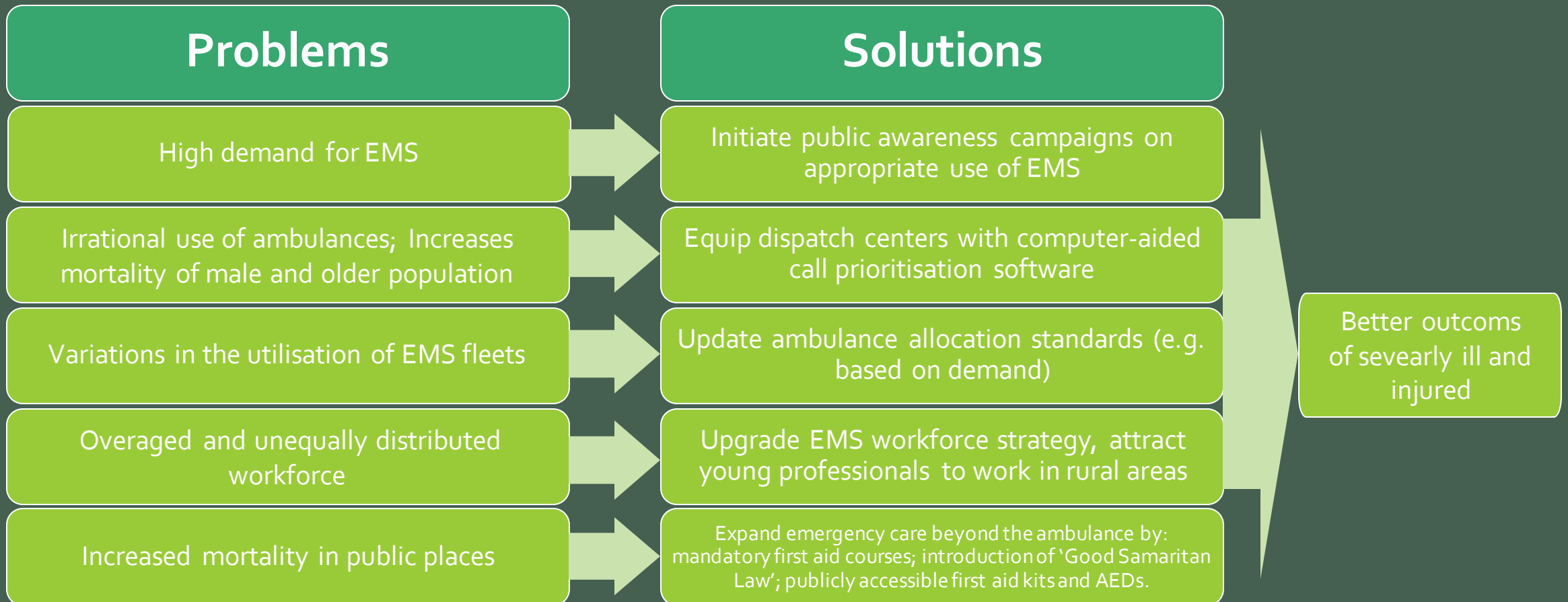


Irrational use of limited EMS recourses

Ambulance non-conveyance rate in Ukraine compared to other countries



TASK 4: RECOMMENDATIONS TO IMPROVE DELIVERY OF EMS IN UKRAINE



CONCLUSION

EMS building blocks

- The demand for EMS services in Ukraine is higher than in other European countries, and little is done to triage the demand. This results in overuse of the system, which can reduce quality of care and influence outcomes.
- The EMS workforce, funding, and utilisation of fleet varies significantly between oblasts. Which can result in variations in access, quality, and outcomes of EMS care across Ukraine.

Risk factors associated with mortality

- Response time (AOR 0.981; CI 0.976 - 0.986; $p < 0.001$);
- Incident in public place (AOR 2.417; CI 1.667 - 3.505; $p < 0.001$); and
- Patient's sex (AOR 2.063; CI 1.672 - 2.546; $p < 0.001$) and age (AOR 0.990; CI 0.983 - 0.997; $p = 0.004$).

Further research is needed to investigate other components of the system and risk factors that can potentially influence outcomes of patients in emergency conditions.

**THANK YOU FOR YOUR
ATTENTION!**