SAFETY

simulation for medical practice

SIMULATION APPROACH FOR EDUCATION AND TRAINING IN EMERGENCY

WP1 Final report

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DOCUMENT VERSION 01

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Summary

Global View Methodology

Each Higher Educational Institution (HEI) partner conducted a desk research on the **educational offer** in the emergency field in their country. Additionally, the Hospital Clínic (Barcelona, Spain) included European Scientific Societies in their research.
The Hospital Clínic also conducted research on current **good practices** regarding simulation in the emergency field. Private company partners provided access to their own good practices to the Hospital Clínic to complete this task.
Finally, the Hospital Clínic gathered and analysed the results.
This is a pragmatic approach for these tasks. For further information regarding the project, please read the official detailed project description.

DESK RESEARCH ON EDUCATIONAL OFFER

Protocol for Data Collection on educational offer

Information regarding the educational offer in the emergency field was collected through a guide to data collection. This data collection guide included the same questions as those on RedCap (annex 1).

1. Each HEI partner used the data collection guideline as a guide to access the information from the internet if possible.
2. All questions from the guideline had an "information unavailable" or "other" answer option.
3. Each HEI partner had the option to initially collect the information on paper (on either the printed or electronic versions) but the information had to be transferred latter to RedCap (access to the service was provided to partners). The **final official way** to convey the information was **RedCap**.

Source of Information

For each country

- Those universities with medical and/or nursing school
- University hospitals and/or tertiary hospital
- Emergency services
- National Scientific Societies
    - Anaesthesiology
    - Emergency Medicine
    - Intensive Care Medicine
    - Cardiology
    - Obstetric
    - Paediatrics
    - Simulation
    - Resuscitation Councill
    - Prehospital Medicine /Paramedicine

    - Midwifery
    - Nursing
- Simulation centres affiliated to National Simulation Society

For Hospital Clínic (Barcelona, Spain)

- Those above mentioned in the section “for each country”
- European Scientific Societies of
    - Anaesthesiology
    - Emergency Medicine
    - Intensive Care Medicine
    - Cardiology
    - Obstetric
    - Paediatrics
    - Simulation
    - Resuscitation Councill
    - Prehospital Medicine/ Paramedicine
    - Midwifery
    - Nursing

Steps-Desk Research

Each researcher followed the next steps when conducting the desk research.

1. Search on the source of information (hospital, university, scientific society) official website
2. Search on the source of information (hospital, university, scientific society) social media
3. Searching these terms on google:
   Emergency + course + Source of information name (hospital, university, scientific society) + area of interest (anaesthesiology, emergency medicine, intensive care medicine, cardiology, obstetrics, simulation, nursing, prehospital medicine).

The following criteria were followed when conducting the desk research:

- All the eligible emergency educational offer (courses, masters, workshops, webinars, etc) since 2019 until 2021 was included.
- The emergency educational offer was included **regardless** of the use of simulation.
- Educational offer was not included **just because it involved simulation**. It had to be related to emergency.
- If previous editions for some courses, masters or workshops were available, researchers only included one edition (the most recent one) for course, master, or workshop.
- If the same course, master, or workshop was offered by more than one institution (Hospital, University, etc), researchers only included the course, master, or workshop once.
- Other ways of getting information different from the online one were avoided to reduce bias. The research methodology was meant to be reproducible by all the

research partners. Researchers were told that it was ok no to have information, as long as they had conducted the research conscientiously.

- Each question had an information unavailable answer option. Therefore, if there was little information on a specific course, researchers were told that it was ok to have little information, as long as they had conducted the research conscientiously.
- An email contact (JMPERDOM@clinic.cat) was provided to the researchers in case they needed help at any point of the desk research.

Duties

Partner: **Hospital Clinic** (Spain)
Responsible Person: **Juan Perdomo** & colleagues
Tasks:

- Spanish Desk Research->Upload country's data into RedCap
- European Desk Research->Upload data into RedCap
- Analysis and results of all the data included by all the partners

Partner: **University of Stavanger** (Norway)
Responsible Person: **Camilla Normand** & colleagues
Tasks:

- Norwegian Desk Research->Upload country's data into RedCap

Partner: **University of Foggia** (Italy)
Responsible Person: **Roberta Caporusso** & colleagues
Tasks:

- Italian Desk Research->Upload country's data into RedCap

Partner: **The Emergency Institute of Cardiovascular Disease "Prof Dr CC Iliescu"** (Romany)
Responsible Person**: Mihai Stefan** & colleagues
Tasks:

- Romanian Desk Research->Upload country's data into RedCap

Partner: **LMU Munich** (Germany)
Responsible Person**: Katarina Grujic** & colleagues
Tasks:

- German Desk Research-> Upload country's data into RedCap

Mid-point Review

We did a mid-point review once the pilot research on the emergency educational offer in Catalonia (between 1st March and 19th March) was finished. We concluded that the proposal plan for the desk research was feasible.

- We were able to get information from more than half (58%) of the universities with medical and/or nursing school, university hospitals and/or tertiary hospital and emergency services from the Catalan official list.
- 155 courses, Masters, workshops, etc, related to the emergency field were included
- The vast majority of the information was obtained from the public hospital and public university websites (96%)
- The syllabi were available online in 74% of the included records.
- The target group was heterogenous, with courses targeting specialist physicians being the most common ones and with fewer courses targeting undergraduate nurses and physicians. The emergency offer was also distributed widely across the different emergency fields.
- Simulation was stated to be used in 47% of the included emergency offer.
- When simulation was stated to be used, only 4% had non-technical skills as specific/unique goals to be achieved.
- When it comes to the effect of the COVID-19 pandemic on the emergency offer, 19% of the included emergency offer was affected by the pandemic. However, 67% of the included records did not have information on this topic.

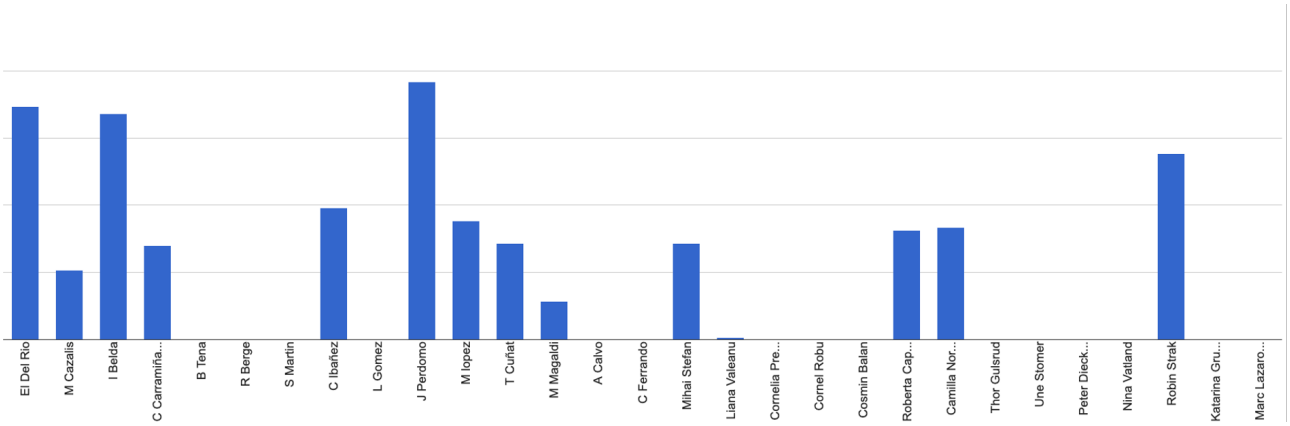
Once we shared the results of the pilot research with the other project partners, and the feasibility of the desk research strategy was confirmed, the desk research strategy continued as planned.

Statistical methods

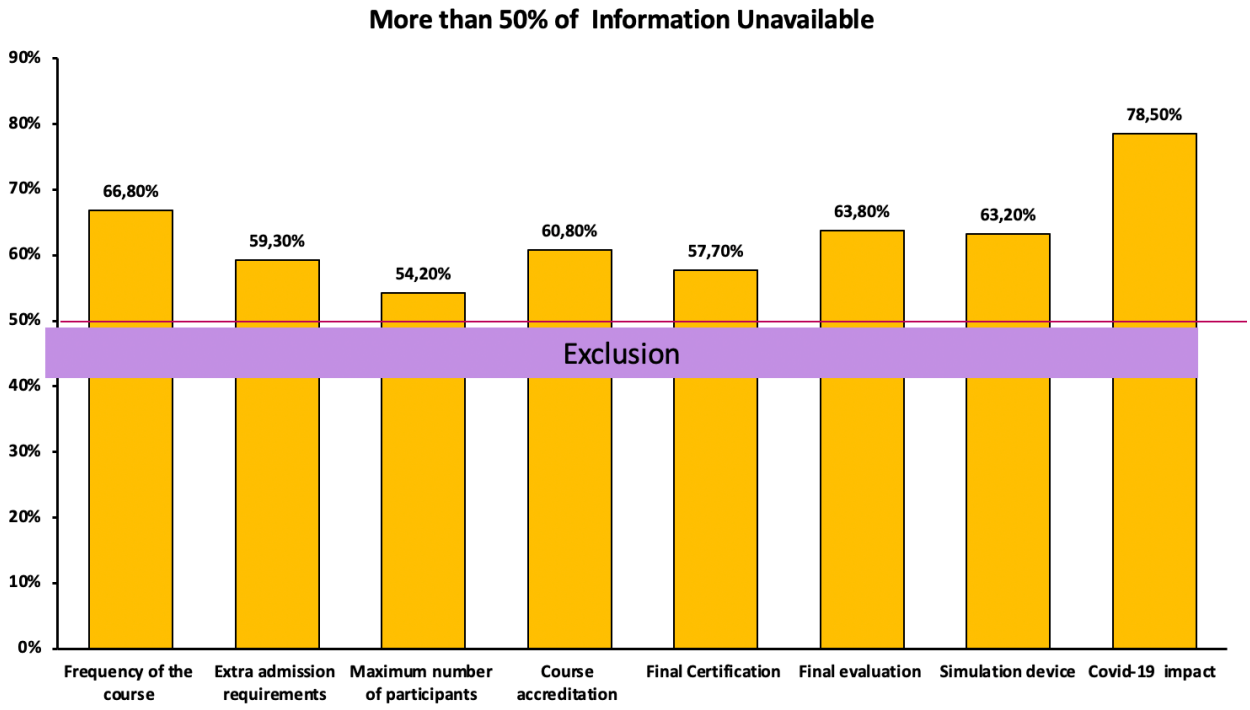
Courses characteristics were summarized using, as descriptive measures, frequencies with percentages. In the bivariate contrasts Pearson's Chi-squared test with Yates' continuity correction were used. The hypothesis tests were established with an alpha risk of 0.05 in test of both tails. No imputation has been made in missing data. All analyses were performed using R 4.1.0 (R Foundation for Statistical Computing, Vienna, Austria).

Results

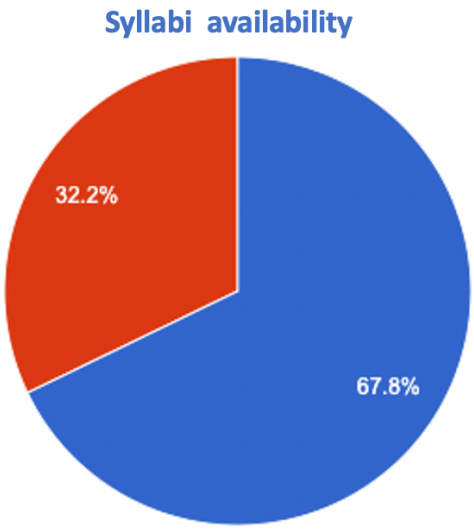
- In total 789 emergency courses (records) were introduced into RedCap. The bar chart below conveys the percentage of records introduced into RedCap by each researcher.



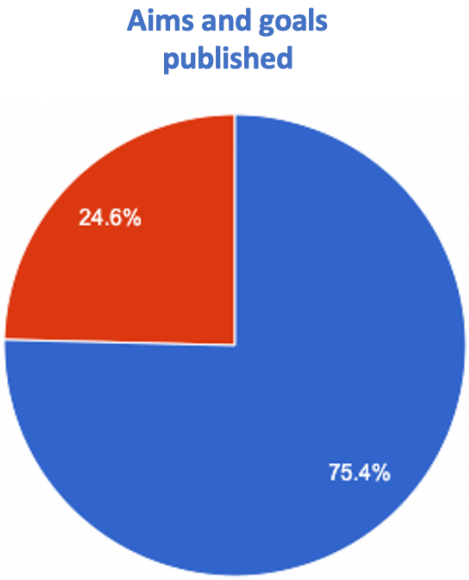
- We excluded from the analysis those variables with more than 50% of information unavailable. Please see the bar chart below



- A significant percentage of information was available online for the desk research. Please see the pie chart below.

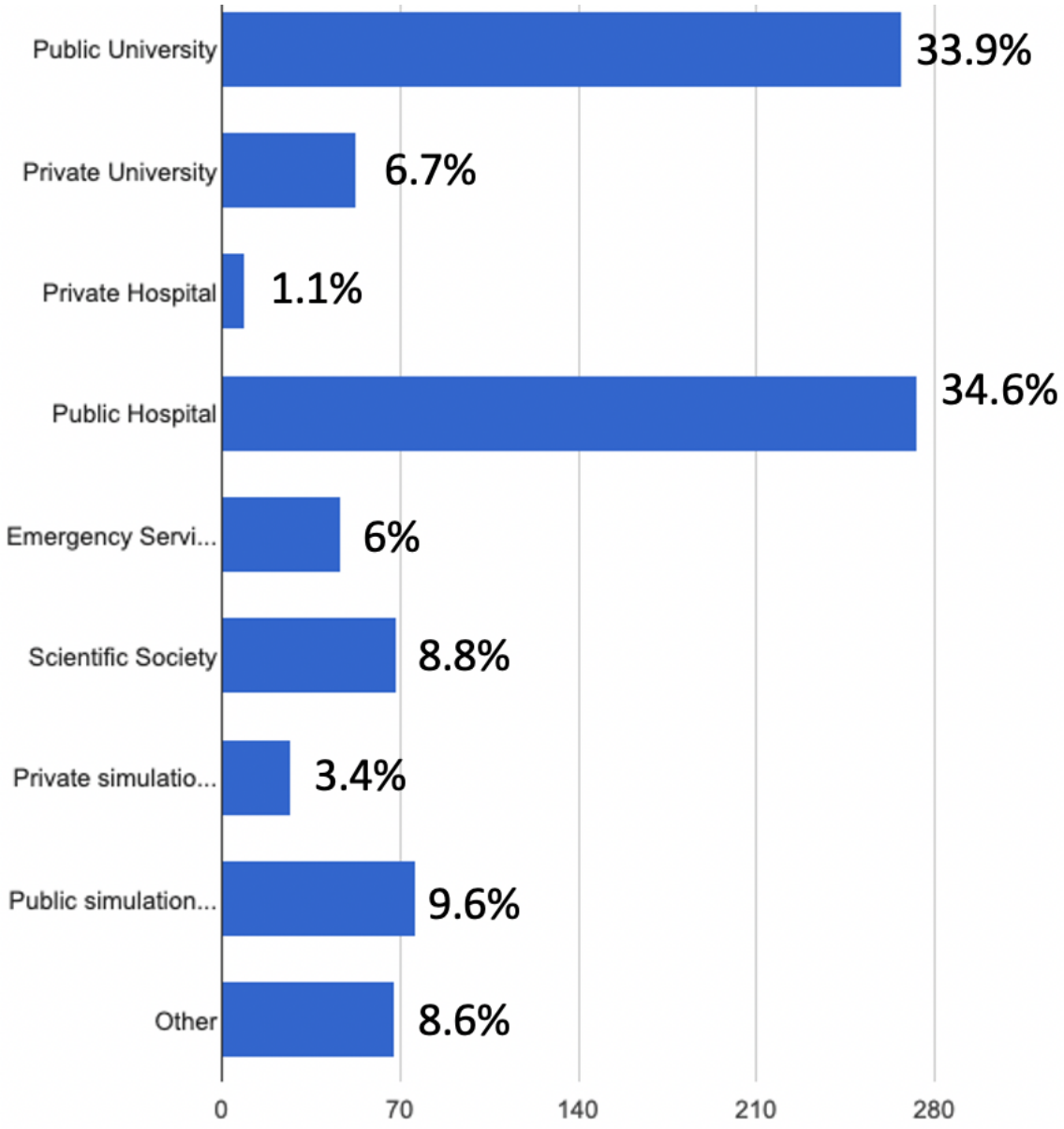


Pie chart showing the percentage of syllabi available (blue) vs not available (red)



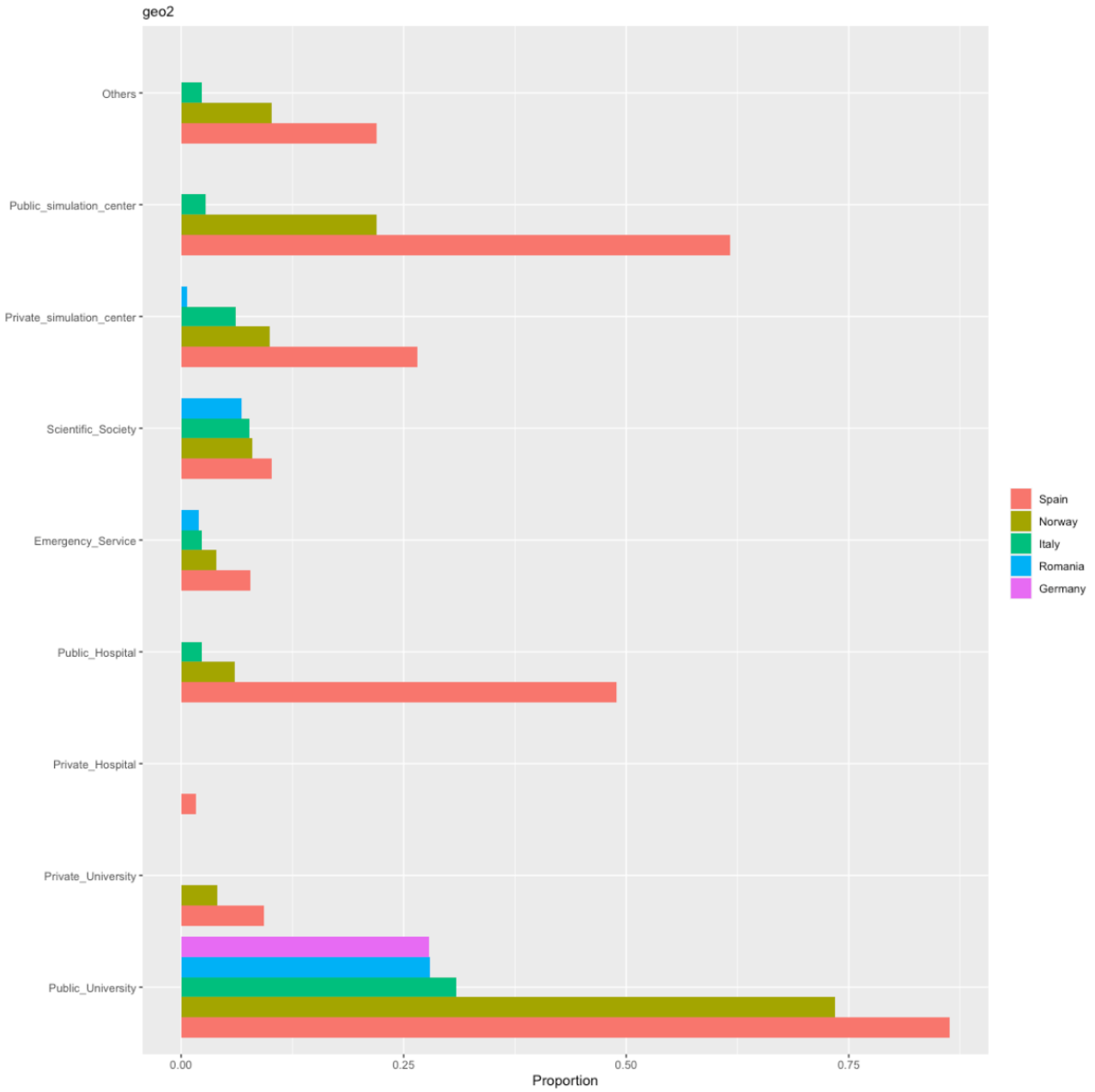
Pie chart showing the percentage of published goals (blue) vs not published (red)

- When it comes to the institution offering the emergency courses, most of them were offered by public institutions. Please see the bar chart below.



Bar chart showing the percentage of courses offered by each institution.

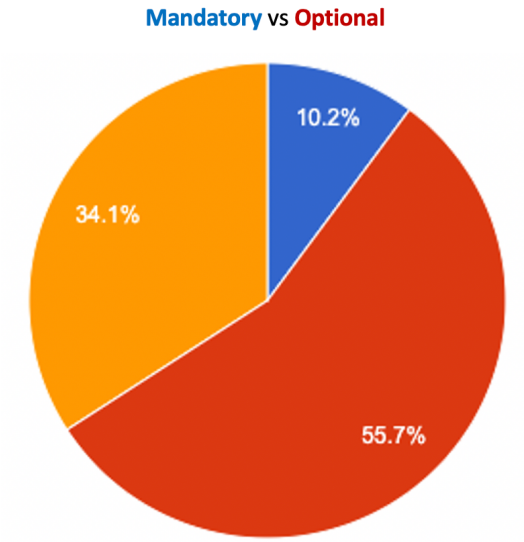
- Public universities, public hospitals, simulation centres –both, private and public– showed a statistically significant difference in their distribution across the countries participating in Safety. Please see the bar chart below.



Bar chart showing in proportions the relationship between institutions and countries participating in SAFETY.

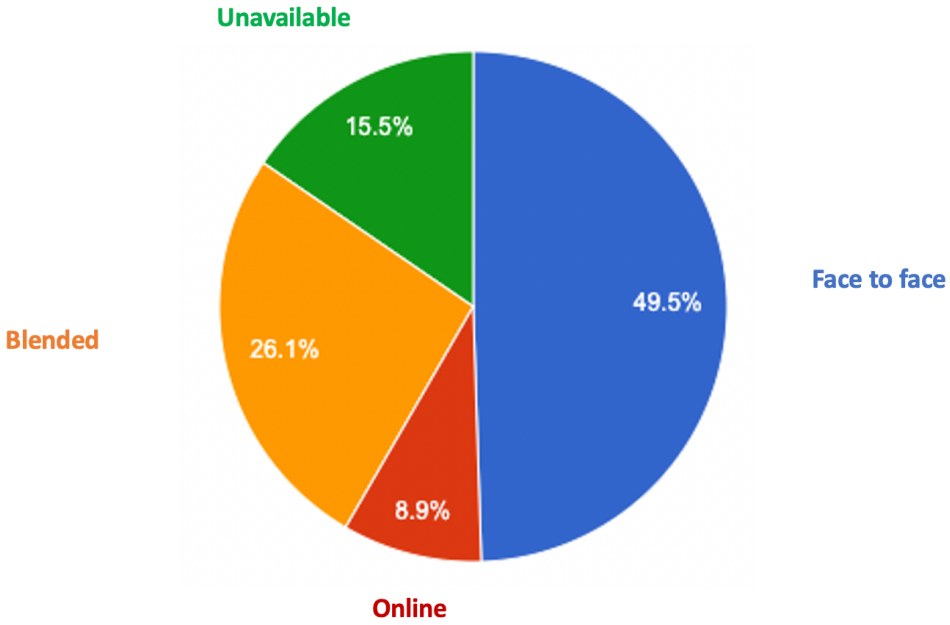
	Spain	Norway	Italy	Romania	Germany	p	test
n	550	50	49	44	81		
Public_University = 1 (%)	153 (27.8)	14 (28.0)	36 (73.5)	38 (86.4)	25 (30.9)	<0.001	
Private_University = 1 (%)	51 (9.3)	0 (0.0)	2 (4.1)	0 (0.0)	0 (0.0)	0.001	
Private_Hospital = 1 (%)	9 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0.447	
Public_Hospital = 1 (%)	269 (48.9)	3 (6.0)	0 (0.0)	1 (2.3)	0 (0.0)	<0.001	
Emergency_Service = 1 (%)	43 (7.8)	2 (4.0)	1 (2.0)	1 (2.3)	0 (0.0)	0.026	
Scientific_Society = 1 (%)	42 (7.6)	4 (8.0)	5 (10.2)	3 (6.8)	0 (0.0)	0.120	
Private_simulation_center = 1 (%)	4 (0.7)	5 (10.0)	13 (26.5)	0 (0.0)	5 (6.2)	<0.001	
Public_simulation_center = 1 (%)	15 (2.7)	11 (22.0)	0 (0.0)	0 (0.0)	50 (61.7)	<0.001	

- More than half of the participants attended to the courses voluntarily. Please see the pie chart below.



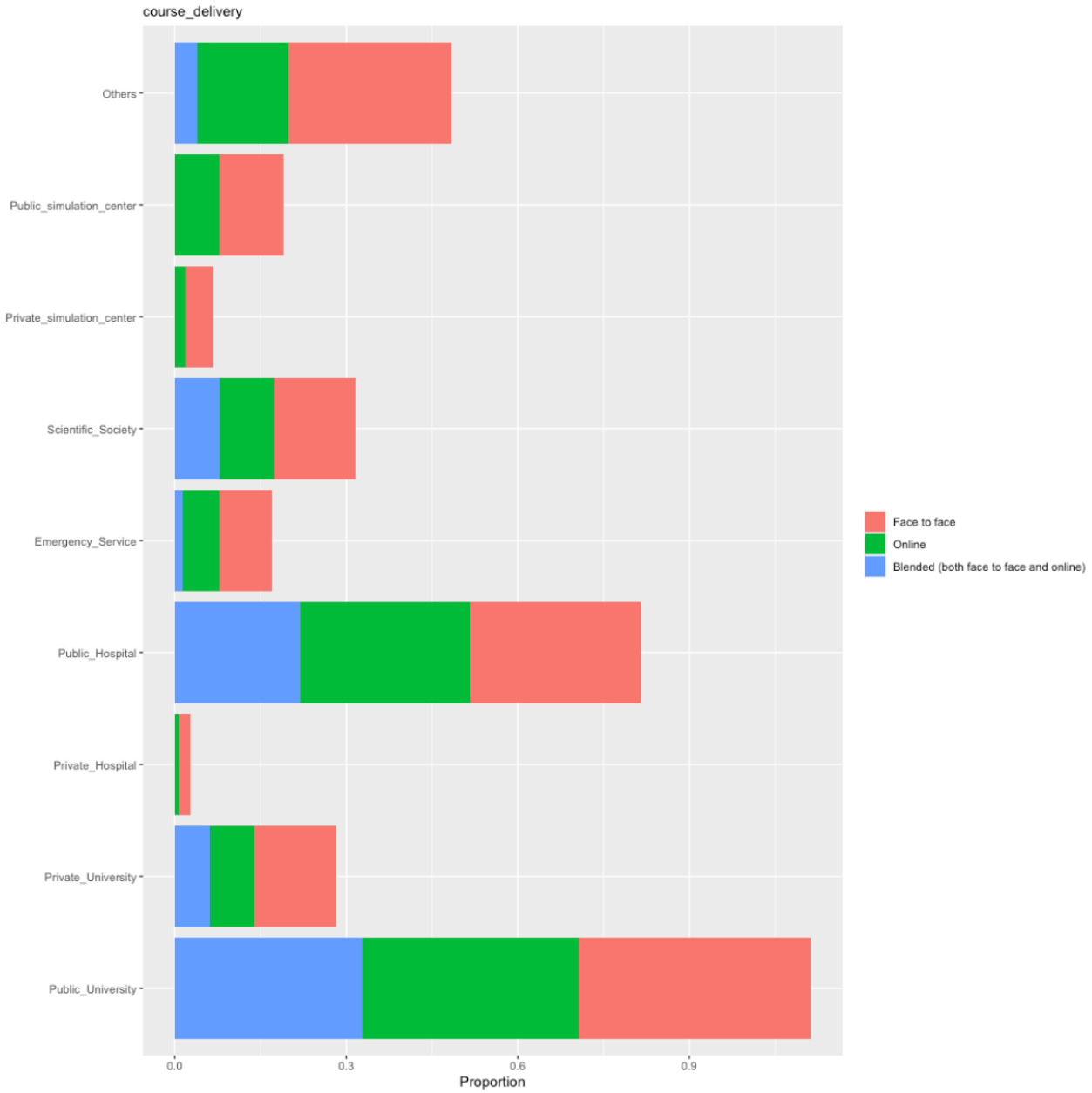
Pie chart showing the percentages of the offer which was optional (red), mandatory (blue) or information unavailable (yellow).

- When it comes to ways of delivering the course, most of the offer involved face to face modality. Face to face modality was either used as single modality or as part of a blended modality. Unfortunately, based on our results we cannot determine the impact of Covid-19 on these data. Please see the pie chart below.



Pie chart showing the percentages of the offer which was delivered face to face (blue), blended (yellow), online (red) or information unavailable (green).

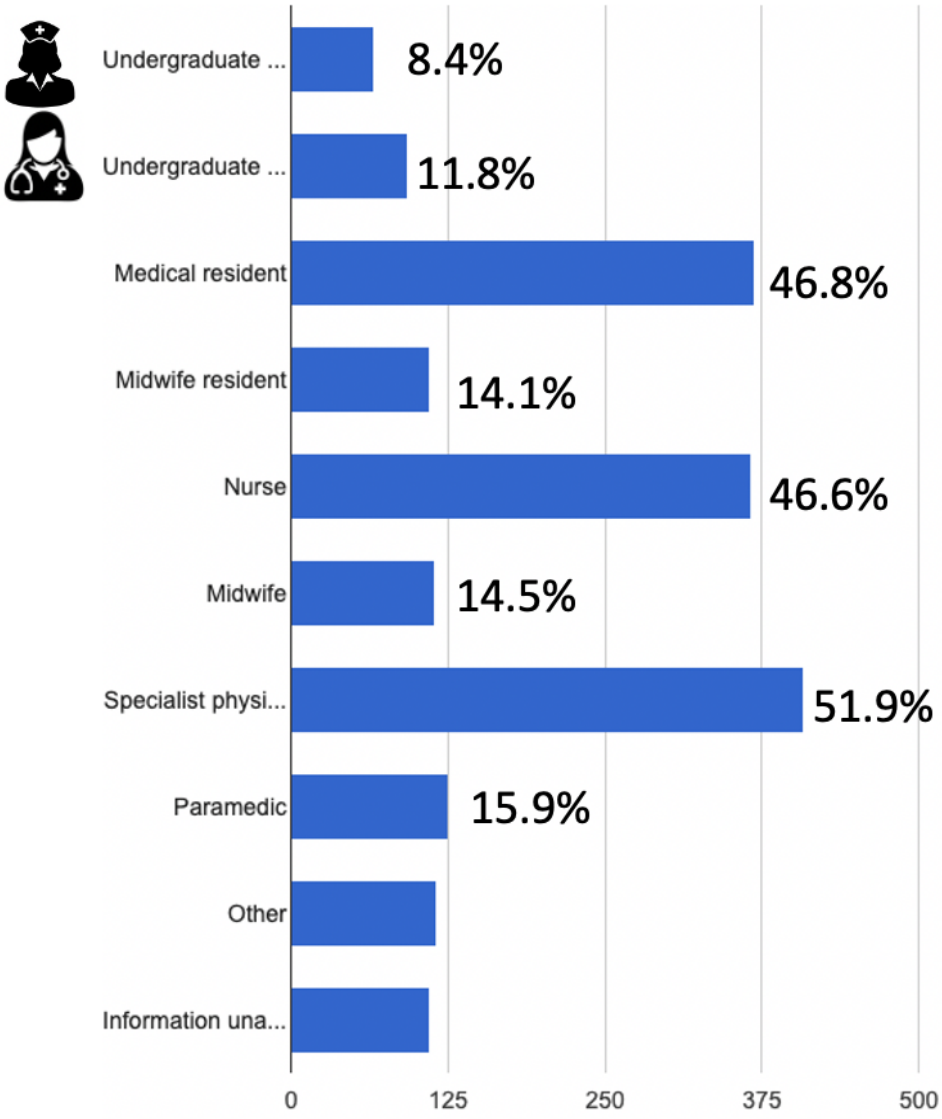
- The way of delivering the course did not show differences across the institutions offering the courses. Please see the bar chart and table below.



Bar chart showing the distribution of the ways of delivering the courses across institutions

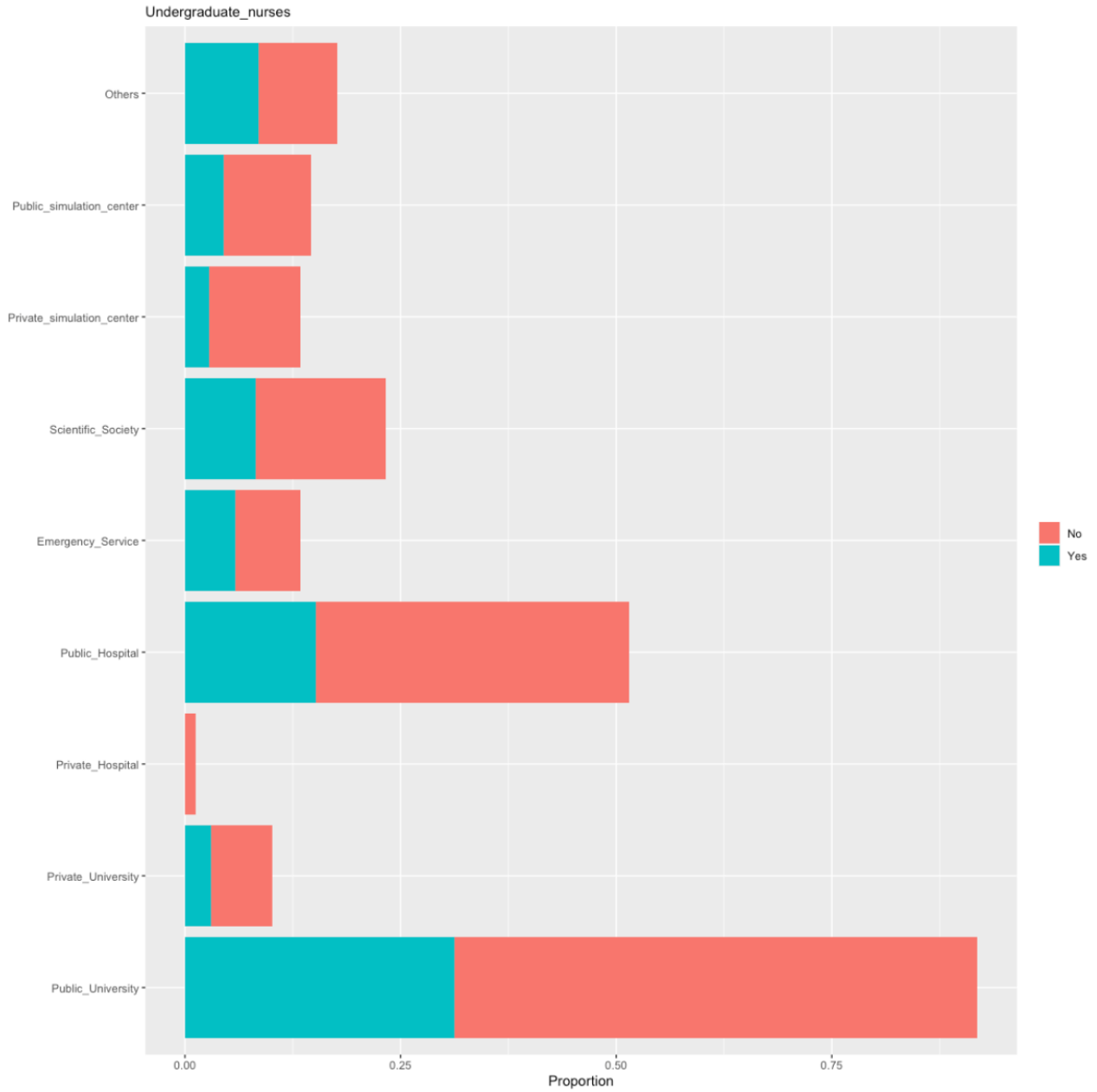
	Face.to.face	Online	Blended..both.face.to.face.and.online.	p	test
n	390	70	206		
Public_University = 1 (%)	158 (40.5)	23 (32.9)	78 (37.9)	0.450	
Private_University = 1 (%)	24 (6.2)	10 (14.3)	16 (7.8)	0.058	
Private_Hospital = 1 (%)	3 (0.8)	0 (0.0)	4 (1.9)	0.271	
Public_Hospital = 1 (%)	116 (29.7)	21 (30.0)	45 (21.8)	0.105	
Emergency_Service = 1 (%)	25 (6.4)	1 (1.4)	19 (9.2)	0.074	
Scientific_Society = 1 (%)	37 (9.5)	10 (14.3)	16 (7.8)	0.273	
Private_simulation_center = 1 (%)	18 (4.6)	0 (0.0)	4 (1.9)	0.058	
Public_simulation_center = 1 (%)	44 (11.3)	0 (0.0)	16 (7.8)	0.008	

- Undergraduate nurses and physicians had the lower percentage of courses targeting them. Please see the bar chart below. The courses could target more than one group of population.



Bar chart showing the percentages of courses that target different group of population

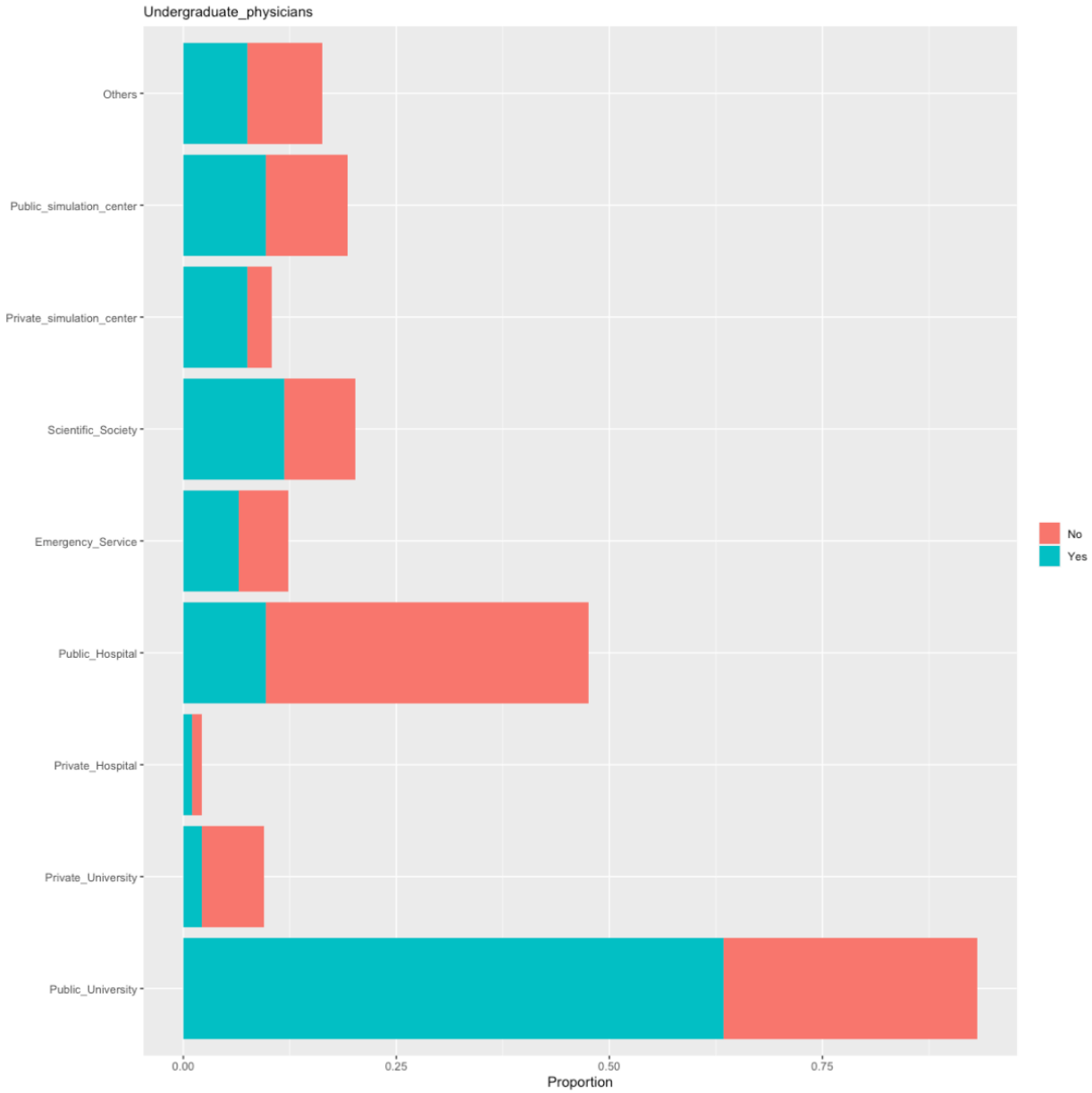
- Among those courses targeting undergraduate nurses, there was a statistically significant tendency of public universities to offer emergency courses to this population. Please see the bar chart and table below.



Bar chart showing the proportion of courses that target undergraduate nurses by institution

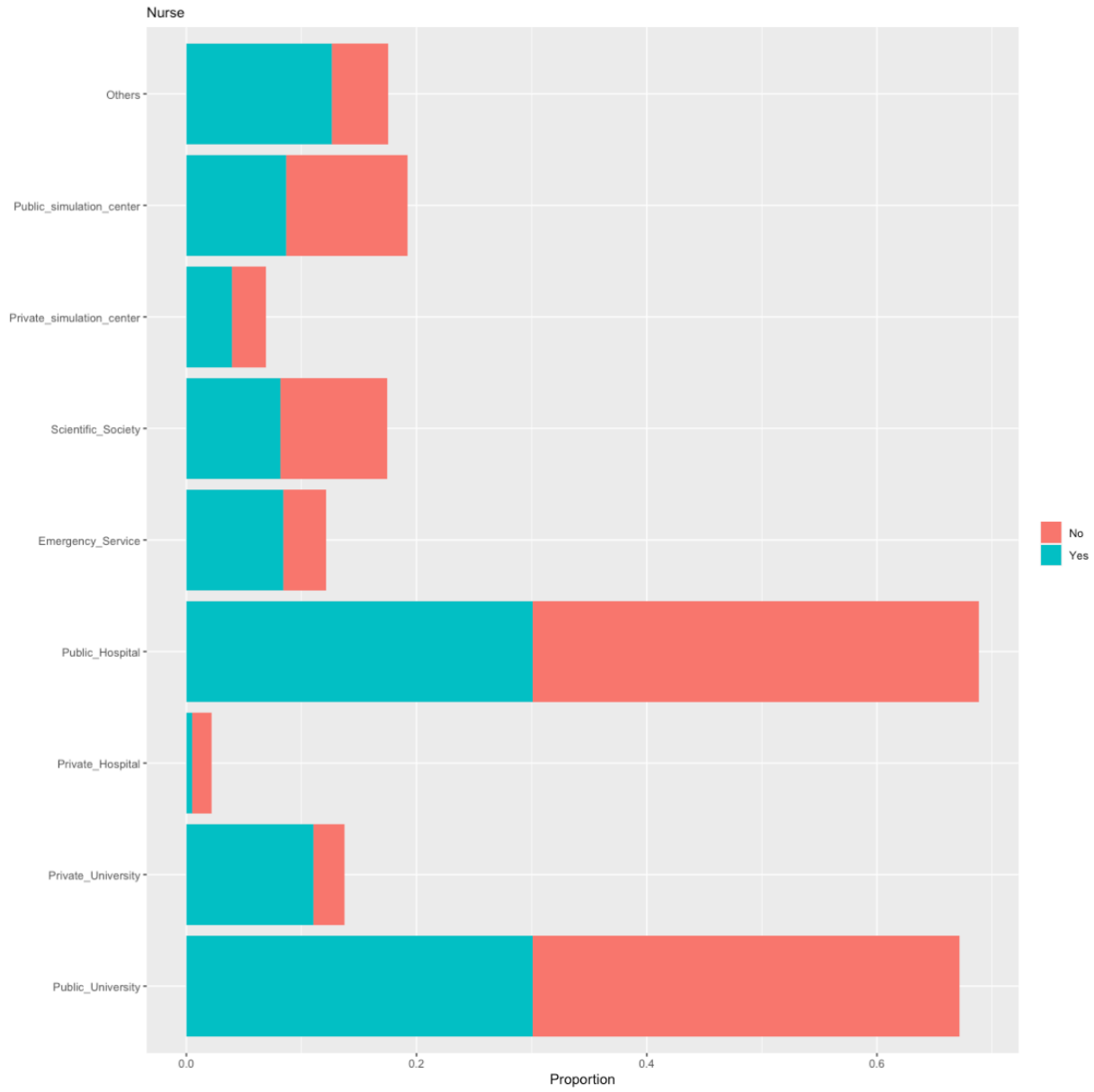
	No	Yes	p	test
n	723	66		
Public_University = 1 (%)	226 (31.3)	40 (60.6)	<0.001	
Private_University = 1 (%)	51 (7.1)	2 (3.0)	0.321	
Private_Hospital = 1 (%)	9 (1.2)	0 (0.0)	0.759	
Public_Hospital = 1 (%)	263 (36.4)	10 (15.2)	0.001	
Emergency_Service = 1 (%)	42 (5.8)	5 (7.6)	0.757	
Scientific_Society = 1 (%)	59 (8.2)	10 (15.2)	0.090	
Private_simulation_center = 1 (%)	20 (2.8)	7 (10.6)	0.003	
Public_simulation_center = 1 (%)	73 (10.1)	3 (4.5)	0.213	
Others = 1 (%)	62 (8.6)	6 (9.1)	1.000	

- Among those courses targeting undergraduate physicians, there was a statistically significant tendency of public universities to offer emergency courses to this population. On the other hand, there was a statistically significant tendency of public hospital not to offer emergency courses to this population. Please see the bar chart and table below.



Bar chart showing the proportion of courses that target undergraduate physicians by institution

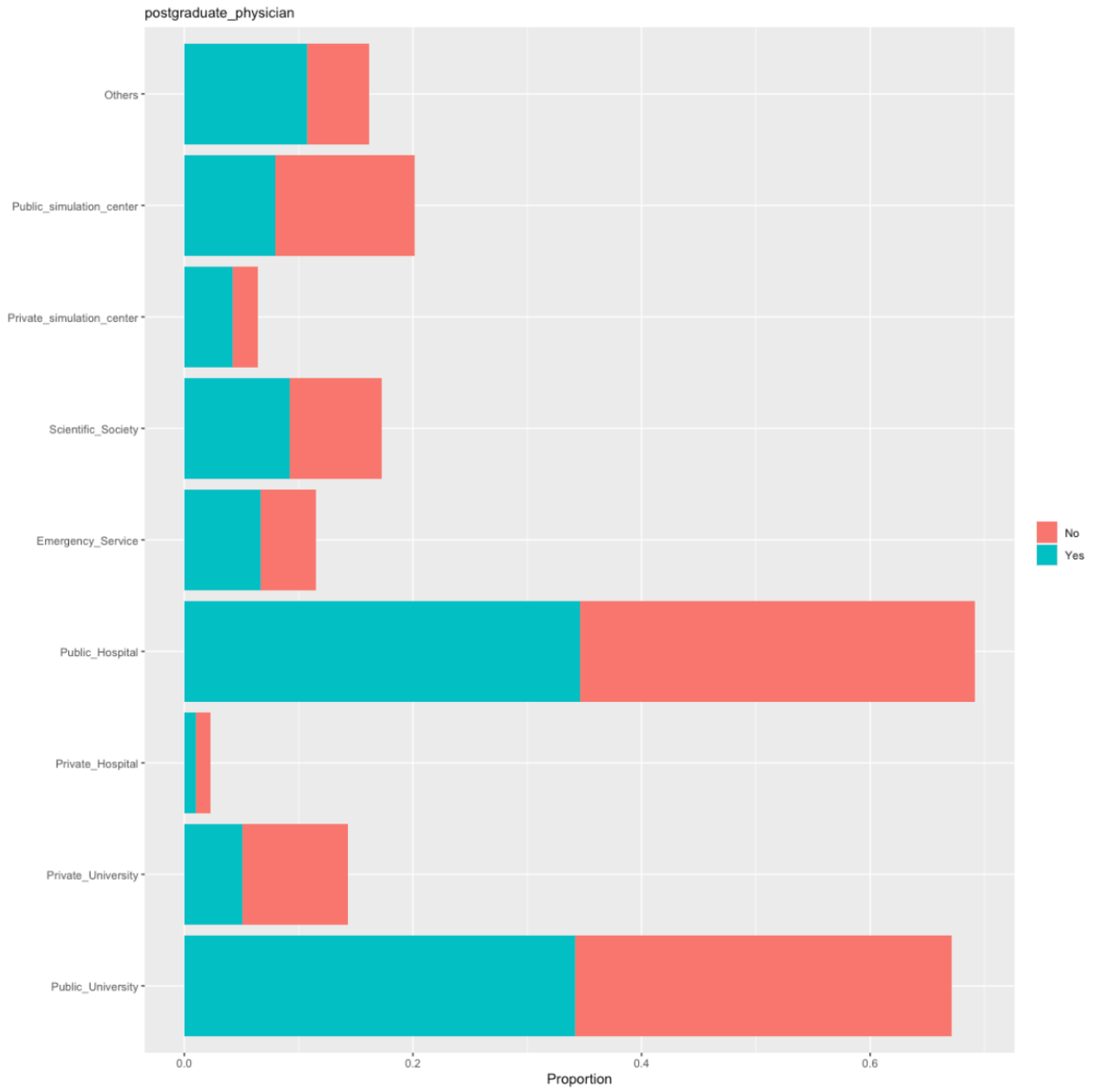
- Among those courses targeting postgraduate nurses (nurses, midwife residents, midwife), there was a statistically significant tendency of private universities to offer emergency courses to this population. Please see the bar chart and table below.



Bar chart showing the proportion of courses that target nurses by institution

n	410	379	
Public_University = 1 (%)	152 (37.1)	114 (30.1)	0.045
Private_University = 1 (%)	11 (2.7)	42 (11.1)	<0.001
Private_Hospital = 1 (%)	7 (1.7)	2 (0.5)	0.221
Public_Hospital = 1 (%)	159 (38.8)	114 (30.1)	0.013
Emergency_Service = 1 (%)	15 (3.7)	32 (8.4)	0.007
Scientific_Society = 1 (%)	38 (9.3)	31 (8.2)	0.678
Private_simulation_center = 1 (%)	12 (2.9)	15 (4.0)	0.549
Public_simulation_center = 1 (%)	43 (10.5)	33 (8.7)	0.468
Others = 1 (%)	20 (4.9)	48 (12.7)	<0.001

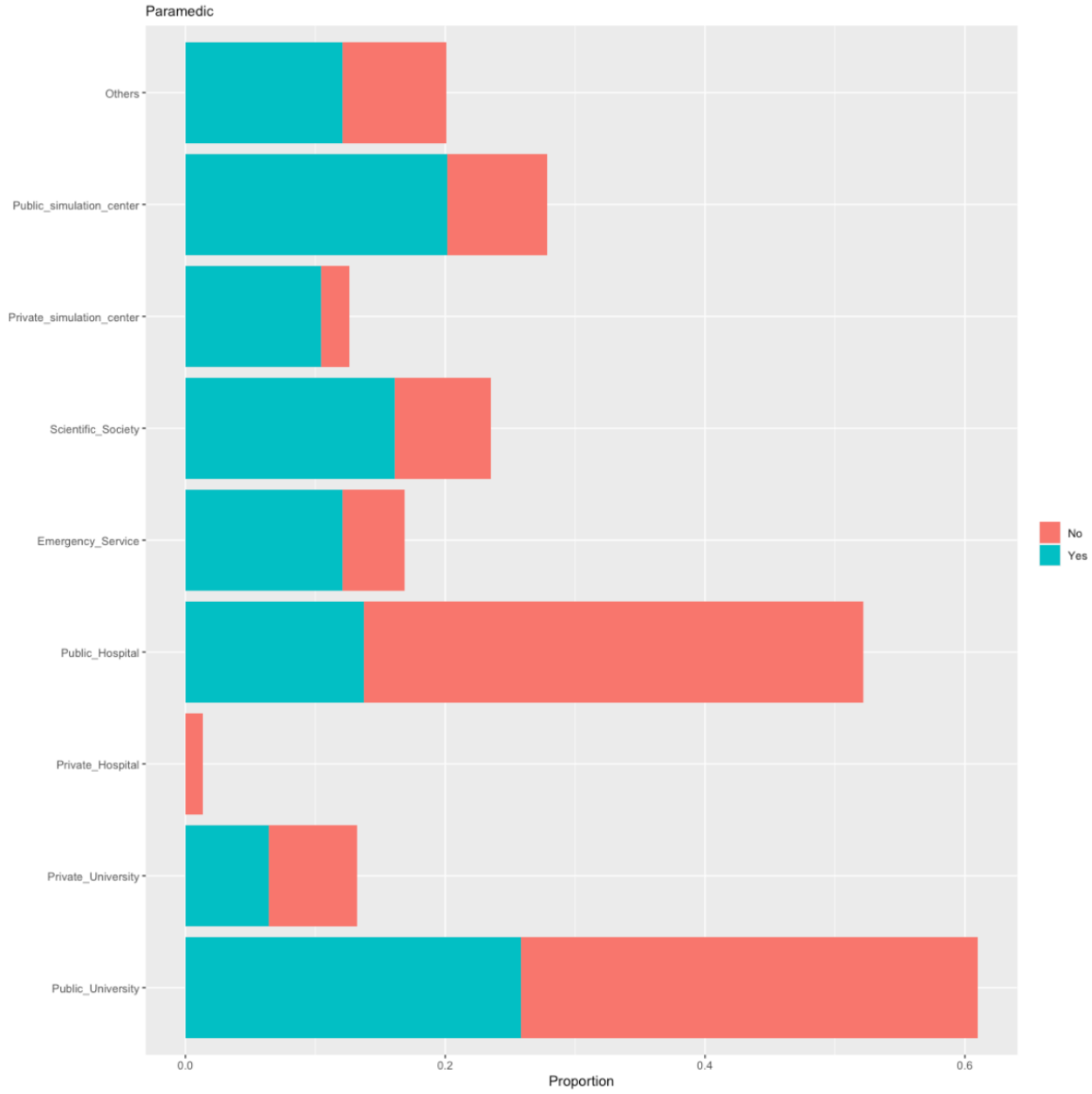
- Those courses targeting postgraduate physicians (residents, fellows, attending physicians) did not show differences across institutions. Please see the bar chart and table below.



Bar chart showing the proportion of courses that target physicians by institution

	No	Yes	p	test
n	313	476		
Public_University = 1 (%)	103 (32.9)	163 (34.2)	0.755	
Private_University = 1 (%)	29 (9.3)	24 (5.0)	0.030	
Private_Hospital = 1 (%)	4 (1.3)	5 (1.1)	1.000	
Public_Hospital = 1 (%)	108 (34.5)	165 (34.7)	1.000	
Emergency_Service = 1 (%)	15 (4.8)	32 (6.7)	0.334	
Scientific_Society = 1 (%)	25 (8.0)	44 (9.2)	0.630	
Private_simulation_center = 1 (%)	7 (2.2)	20 (4.2)	0.199	
Public_simulation_center = 1 (%)	38 (12.1)	38 (8.0)	0.070	
Others = 1 (%)	17 (5.4)	51 (10.7)	0.014	

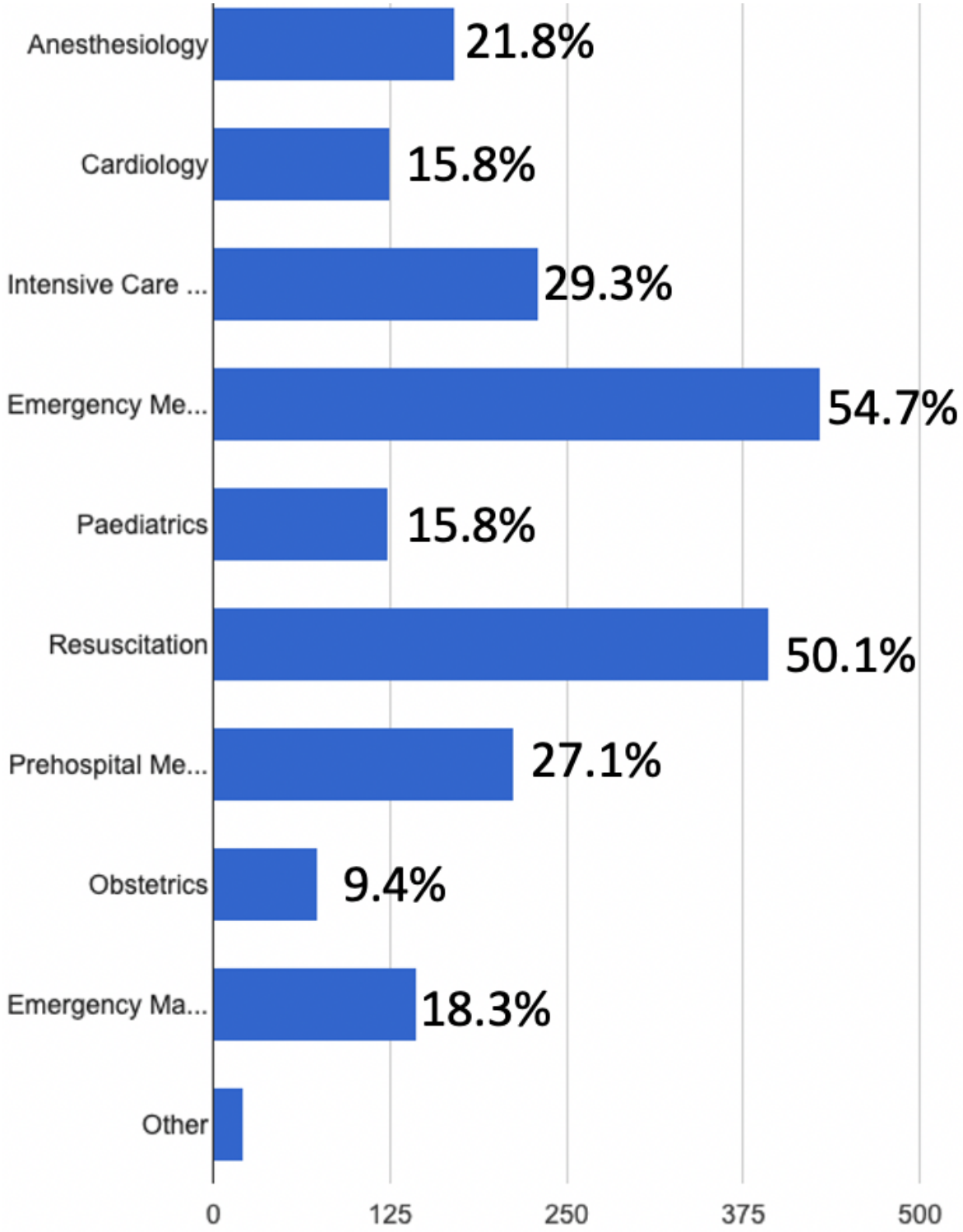
- Among those courses targeting prehospital emergency staff, simulation centres –both, public and private— showed a statistically significant tendency to offer emergency courses targeting this population. On the other hand, public hospitals showed a statistically significant tendency to offer fewer courses targeting this population. Please see the bar chart and table below.



Bar chart showing the proportion of courses that target prehospital emergency staff by institution

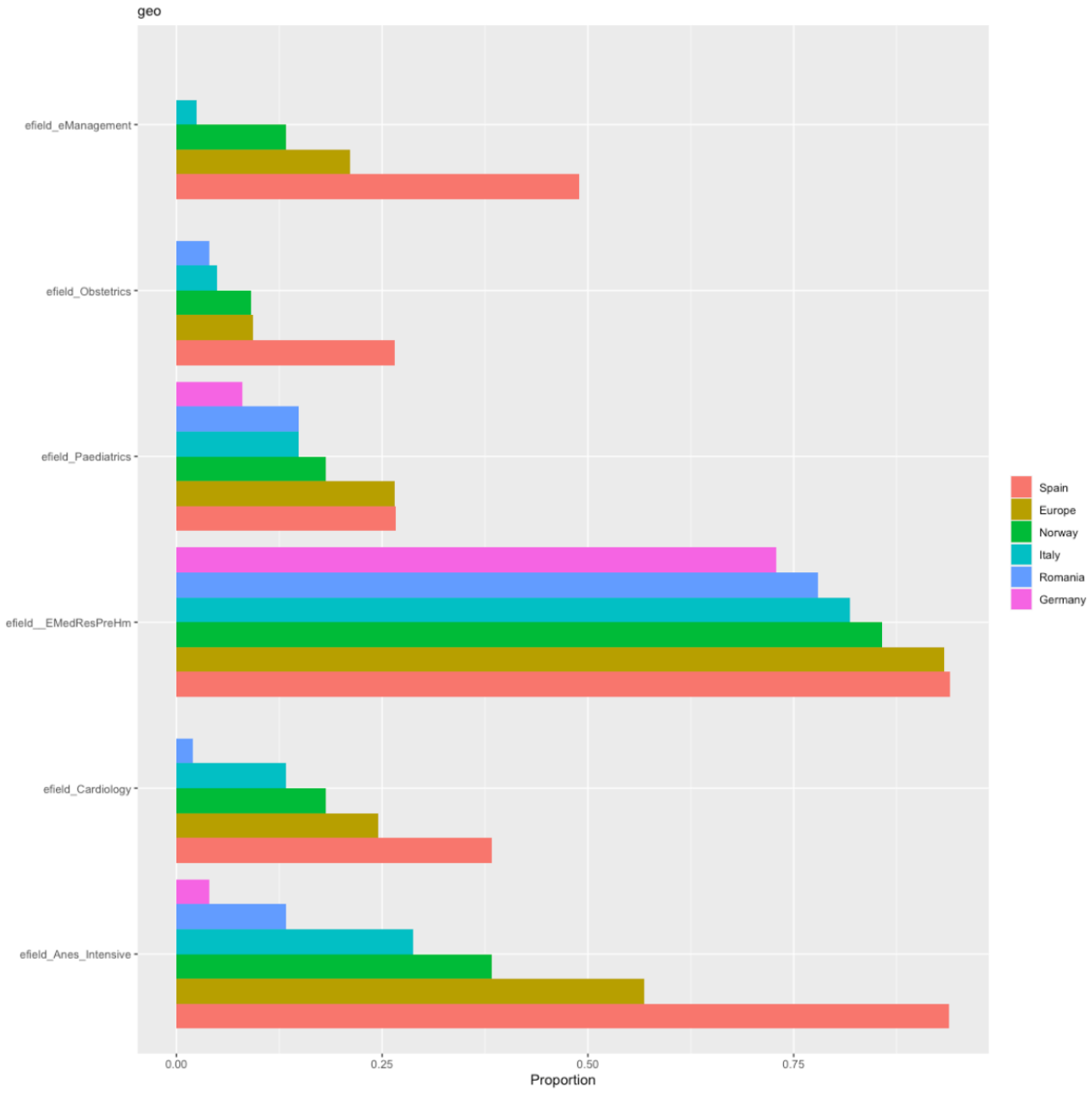
	No	Yes	p	test
n	665	124		
Public_University = 1 (%)	234 (35.2)	32 (25.8)	0.054	
Private_University = 1 (%)	45 (6.8)	8 (6.5)	1.000	
Private_Hospital = 1 (%)	9 (1.4)	0 (0.0)	0.400	
Public_Hospital = 1 (%)	256 (38.5)	17 (13.7)	<0.001	
Emergency_Service = 1 (%)	32 (4.8)	15 (12.1)	0.003	
Scientific_Society = 1 (%)	49 (7.4)	20 (16.1)	0.003	
Private_simulation_center = 1 (%)	14 (2.1)	13 (10.5)	<0.001	
Public_simulation_center = 1 (%)	51 (7.7)	25 (20.2)	<0.001	
Others = 1 (%)	53 (8.0)	15 (12.1)	0.184	

- The offer showed a heterogenous distribution across the different emergency field. The emergency fields were anaesthesiology, cardiology, intensive care, emergency medicine, paediatrics, resuscitation, prehospital medicine, obstetrics, and emergency management. Please see the bar chart below. Courses could target more than one field.



Bar chart showing the percentage of courses distributed across the emergency fields

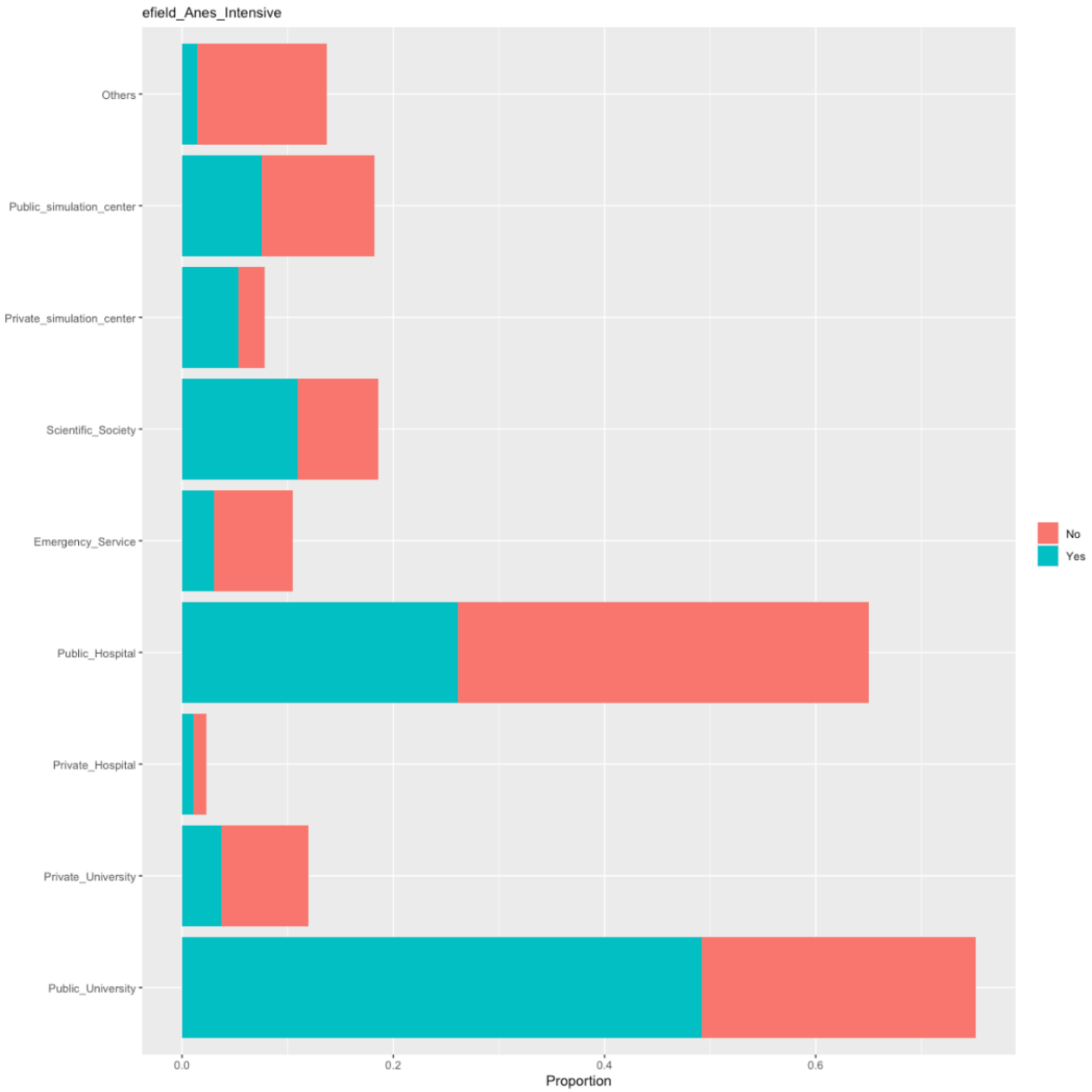
- Some emergency fields showed a statistically significant difference in their distribution across the countries participating in Safety, with Spain showing a tendency to have more courses related to anaesthesiology and intensive care medicine, cardiology, obstetrics, and emergency management. Please see the bar chart and table below.



Bar chart showing in proportions the relationship between emergency field and countries participating in SAFETY.

	Spain	Europe	Norway	Italy	Romania	Germany	p	test
n	550	15	50	49	44	81		
efield_Anes_Intensive = Yes (%)	158 (28.7)	2 (13.3)	2 (4.0)	46 (93.9)	25 (56.8)	31 (38.3)	<0.001	
efield_Cardiology = Yes (%)	73 (13.3)	0 (0.0)	1 (2.0)	12 (24.5)	8 (18.2)	31 (38.3)	<0.001	
efield__EMedResPreHm = Yes (%)	429 (78.0)	14 (93.3)	47 (94.0)	42 (85.7)	36 (81.8)	59 (72.8)	0.029	
efield_Paediatrics = Yes (%)	82 (14.9)	4 (26.7)	4 (8.0)	13 (26.5)	8 (18.2)	12 (14.8)	0.131	
efield_Obstetrics = Yes (%)	51 (9.3)	0 (0.0)	2 (4.0)	13 (26.5)	4 (9.1)	4 (4.9)	<0.001	
efield_eManagement = Yes (%)	116 (21.1)	2 (13.3)	0 (0.0)	24 (49.0)	0 (0.0)	2 (2.5)	<0.001	

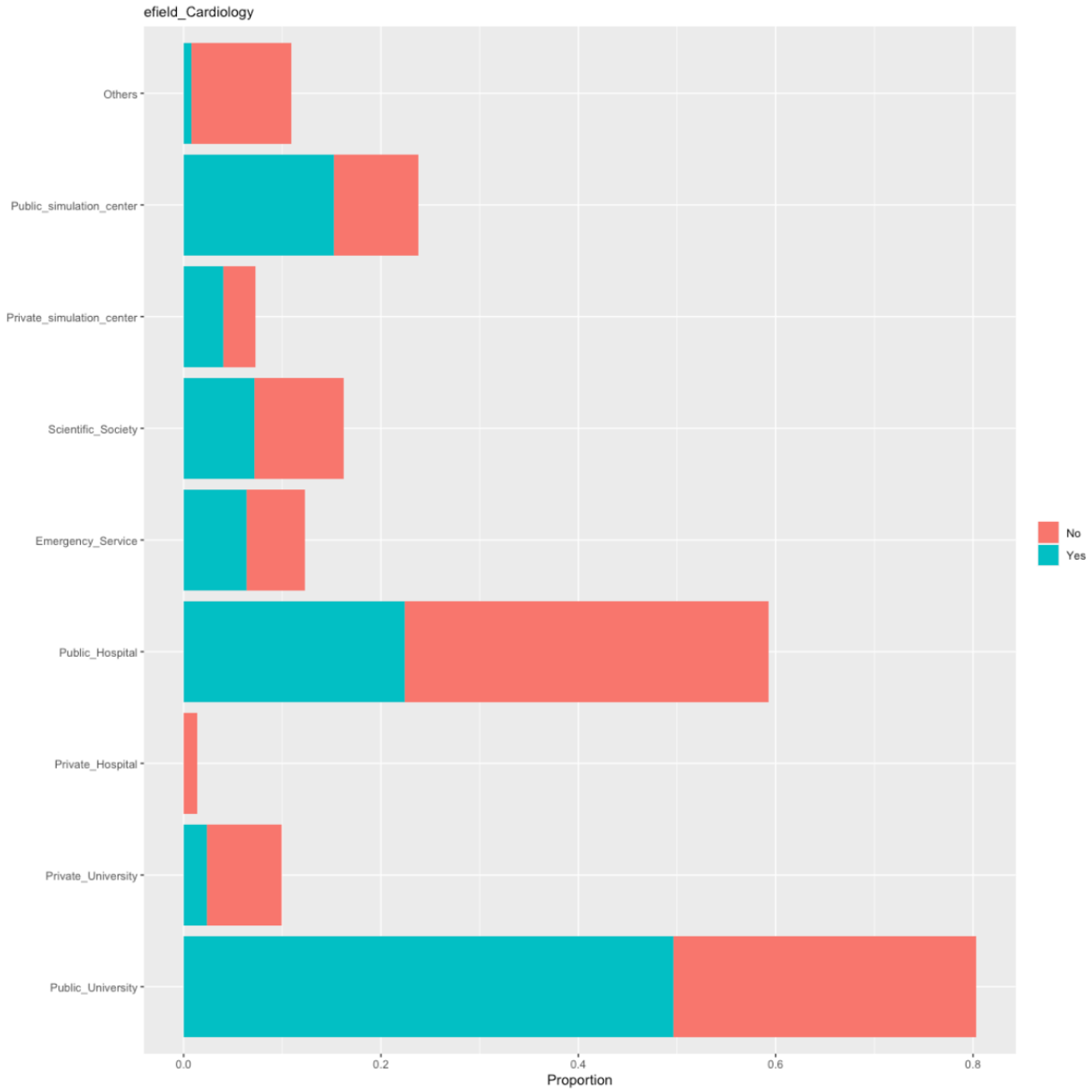
- Among those emergency courses related to anaesthesiology and intensive care, public universities showed a tendency to have a higher number of courses in this field. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution in the field of anesthesiology and intensive care medicine.

	No	Yes	p	test
n	525	264		
Public_University = 1 (%)	136 (25.9)	130 (49.2)	<0.001	
Private_University = 1 (%)	43 (8.2)	10 (3.8)	0.029	
Private_Hospital = 1 (%)	6 (1.1)	3 (1.1)	1.000	
Public_Hospital = 1 (%)	204 (38.9)	69 (26.1)	0.001	
Emergency_Service = 1 (%)	39 (7.4)	8 (3.0)	0.021	
Scientific_Society = 1 (%)	40 (7.6)	29 (11.0)	0.148	
Private_simulation_center = 1 (%)	13 (2.5)	14 (5.3)	0.064	
Public_simulation_center = 1 (%)	56 (10.7)	20 (7.6)	0.207	
Others = 1 (%)	64 (12.2)	4 (1.5)	<0.001	

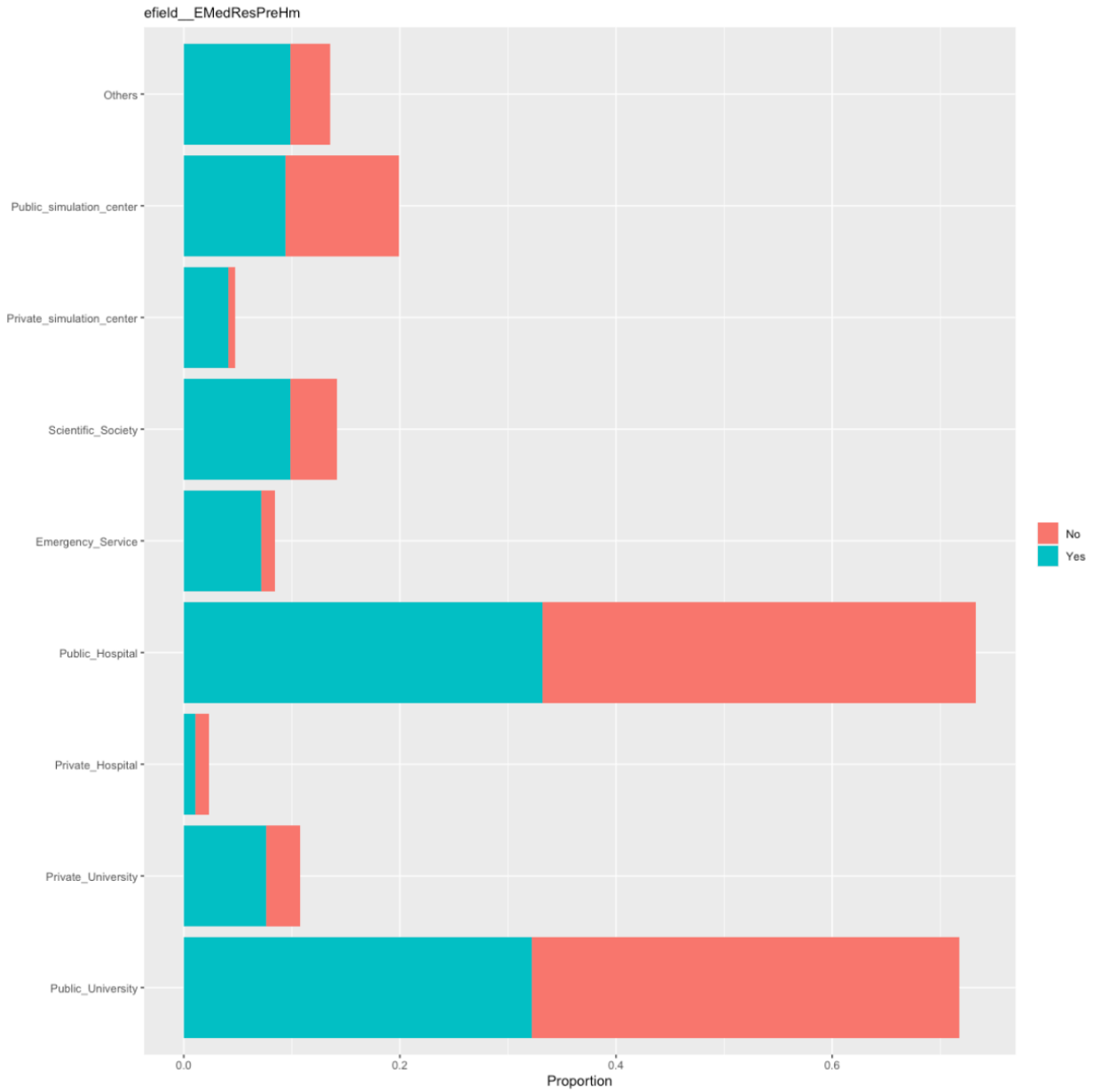
- Among those emergency courses related to cardiology, public universities showed a tendency to have a higher number of courses in this field. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution in the field of cardiology

	No	Yes	p	test
n	664	125		
Public_University = 1 (%)	204 (30.7)	62 (49.6)	<0.001	
Private_University = 1 (%)	50 (7.5)	3 (2.4)	0.056	
Private_Hospital = 1 (%)	9 (1.4)	0 (0.0)	0.395	
Public_Hospital = 1 (%)	245 (36.9)	28 (22.4)	0.002	
Emergency_Service = 1 (%)	39 (5.9)	8 (6.4)	0.982	
Scientific_Society = 1 (%)	60 (9.0)	9 (7.2)	0.621	
Private_simulation_center = 1 (%)	22 (3.3)	5 (4.0)	0.905	
Public_simulation_center = 1 (%)	57 (8.6)	19 (15.2)	0.033	
Others = 1 (%)	67 (10.1)	1 (0.8)	0.001	

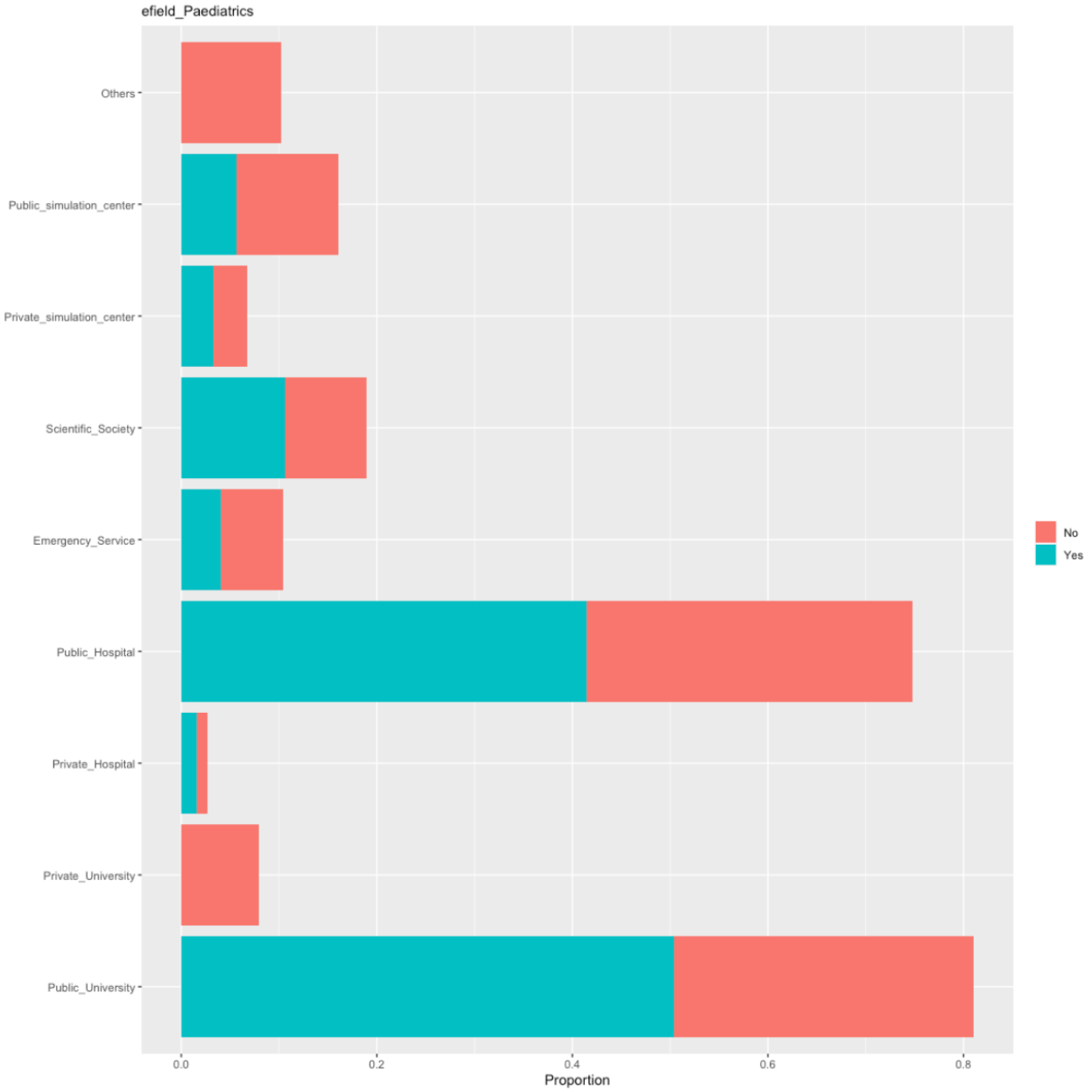
- Among those emergency courses related to emergency medicine, prehospital medicine, and resuscitation there was no difference in their distribution among institutions. Please see the bar chart and table below



Bar chart showing the proportion of courses by institution in the field of resuscitation, prehospital and emergency medicine

	No	Yes	p	test
n	162	627		
Public_University = 1 (%)	64 (39.5)	202 (32.2)	0.098	
Private_University = 1 (%)	5 (3.1)	48 (7.7)	0.058	
Private_Hospital = 1 (%)	2 (1.2)	7 (1.1)	1.000	
Public_Hospital = 1 (%)	65 (40.1)	208 (33.2)	0.118	
Emergency_Service = 1 (%)	2 (1.2)	45 (7.2)	0.008	
Scientific_Society = 1 (%)	7 (4.3)	62 (9.9)	0.038	
Private_simulation_center = 1 (%)	1 (0.6)	26 (4.1)	0.050	
Public_simulation_center = 1 (%)	17 (10.5)	59 (9.4)	0.789	
Others = 1 (%)	6 (3.7)	62 (9.9)	0.019	

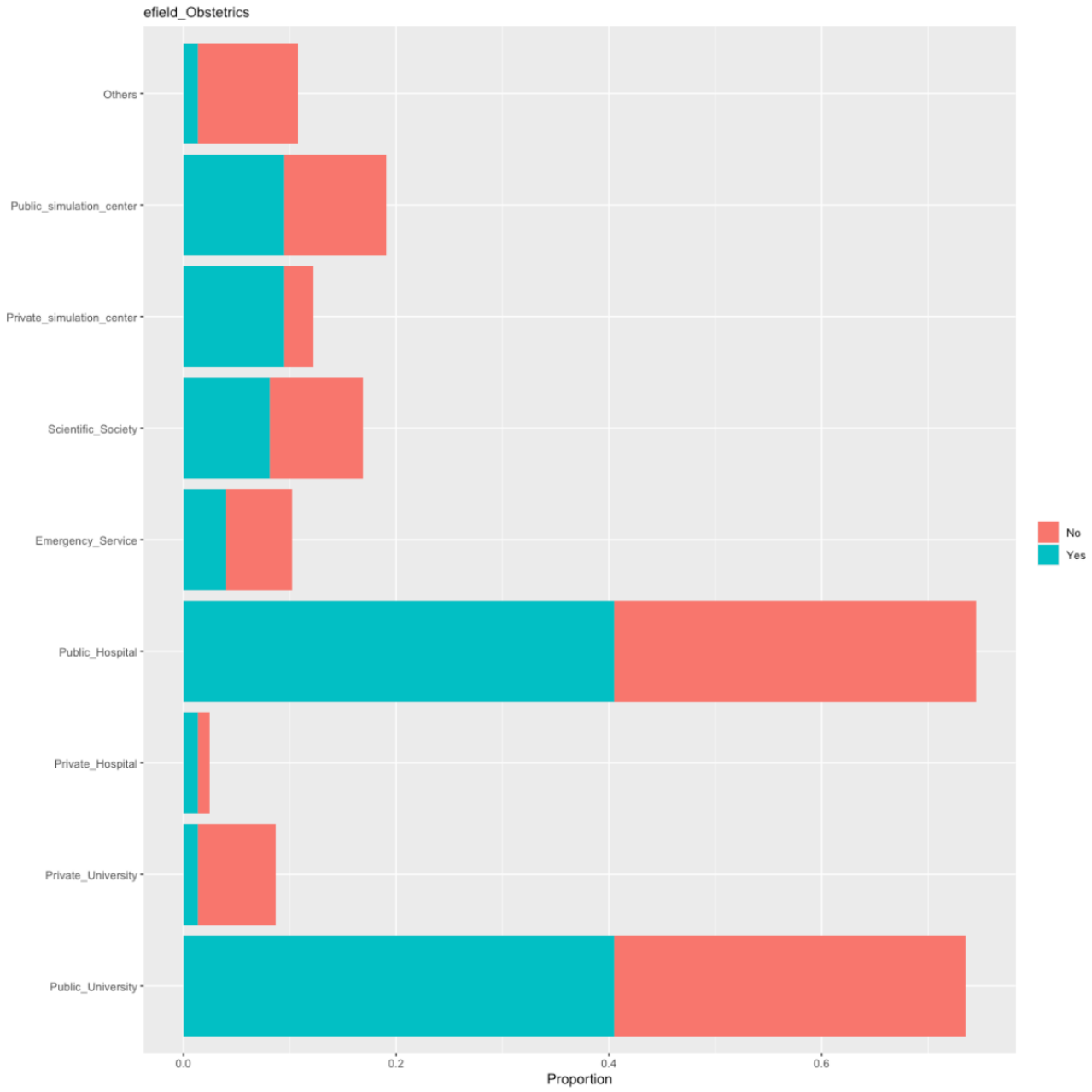
- Among those emergency courses related to paediatrics, public universities showed a tendency to have a higher number of courses in this field. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution in the field of pediatrics

	No	Yes	p	test
n	666	123		
Public_University = 1 (%)	204 (30.6)	62 (50.4)	<0.001	
Private_University = 1 (%)	53 (8.0)	0 (0.0)	0.002	
Private_Hospital = 1 (%)	7 (1.1)	2 (1.6)	0.929	
Public_Hospital = 1 (%)	222 (33.3)	51 (41.5)	0.101	
Emergency_Service = 1 (%)	42 (6.3)	5 (4.1)	0.449	
Scientific_Society = 1 (%)	56 (8.4)	13 (10.6)	0.545	
Private_simulation_center = 1 (%)	23 (3.5)	4 (3.3)	1.000	
Public_simulation_center = 1 (%)	69 (10.4)	7 (5.7)	0.148	
Others = 1 (%)	68 (10.2)	0 (0.0)	<0.001	

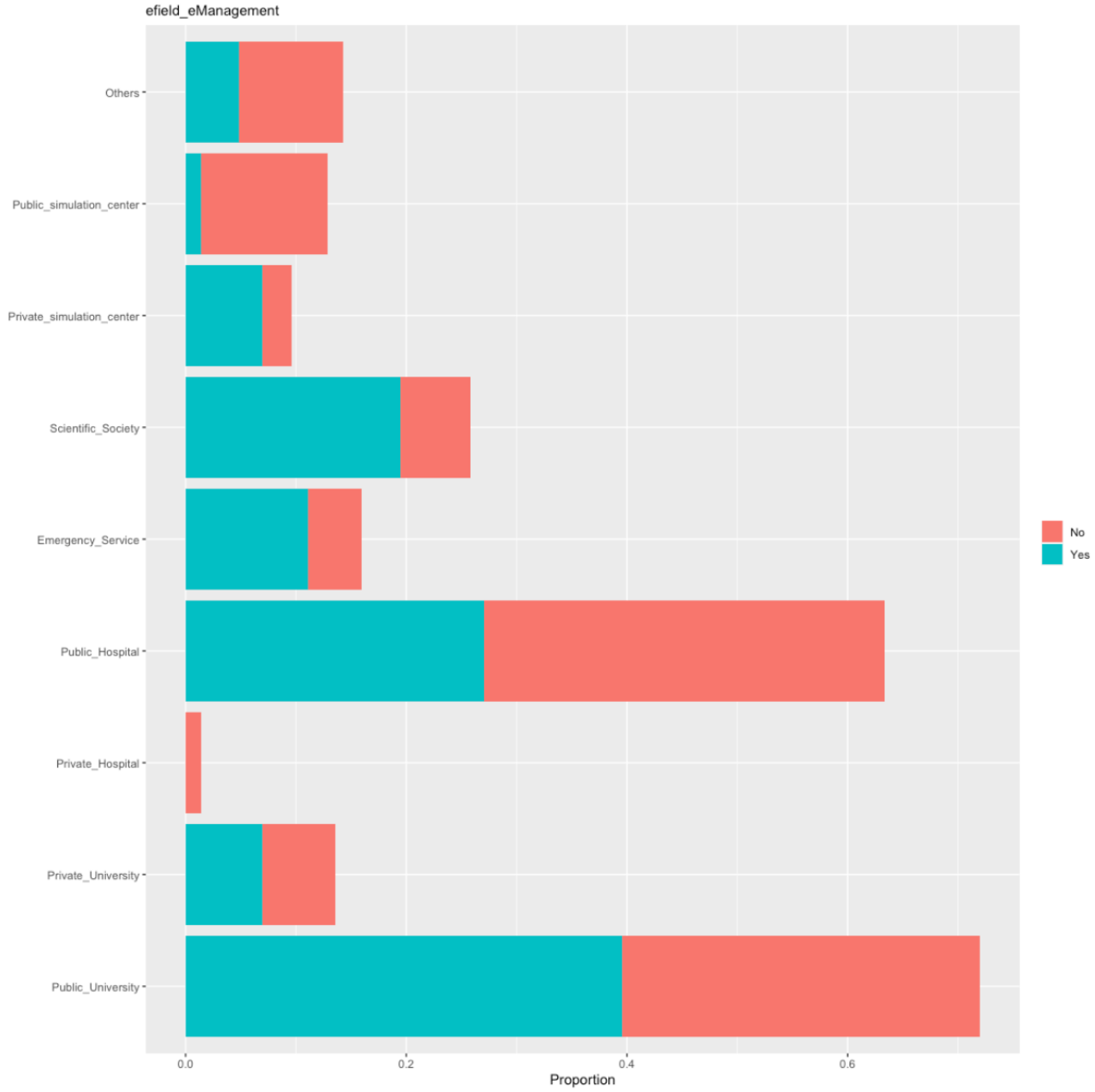
- Among those emergency courses related to obstetrics there was no difference in their distribution among institutions. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution in the field of obstetrics

	No	Yes	p	test
n	715	74		
Public_University = 1 (%)	236 (33.0)	30 (40.5)	0.240	
Private_University = 1 (%)	52 (7.3)	1 (1.4)	0.090	
Private_Hospital = 1 (%)	8 (1.1)	1 (1.4)	1.000	
Public_Hospital = 1 (%)	243 (34.0)	30 (40.5)	0.317	
Emergency_Service = 1 (%)	44 (6.2)	3 (4.1)	0.639	
Scientific_Society = 1 (%)	63 (8.8)	6 (8.1)	1.000	
Private_simulation_center = 1 (%)	20 (2.8)	7 (9.5)	0.008	
Public_simulation_center = 1 (%)	69 (9.7)	7 (9.5)	1.000	
Others = 1 (%)	67 (9.4)	1 (1.4)	0.034	

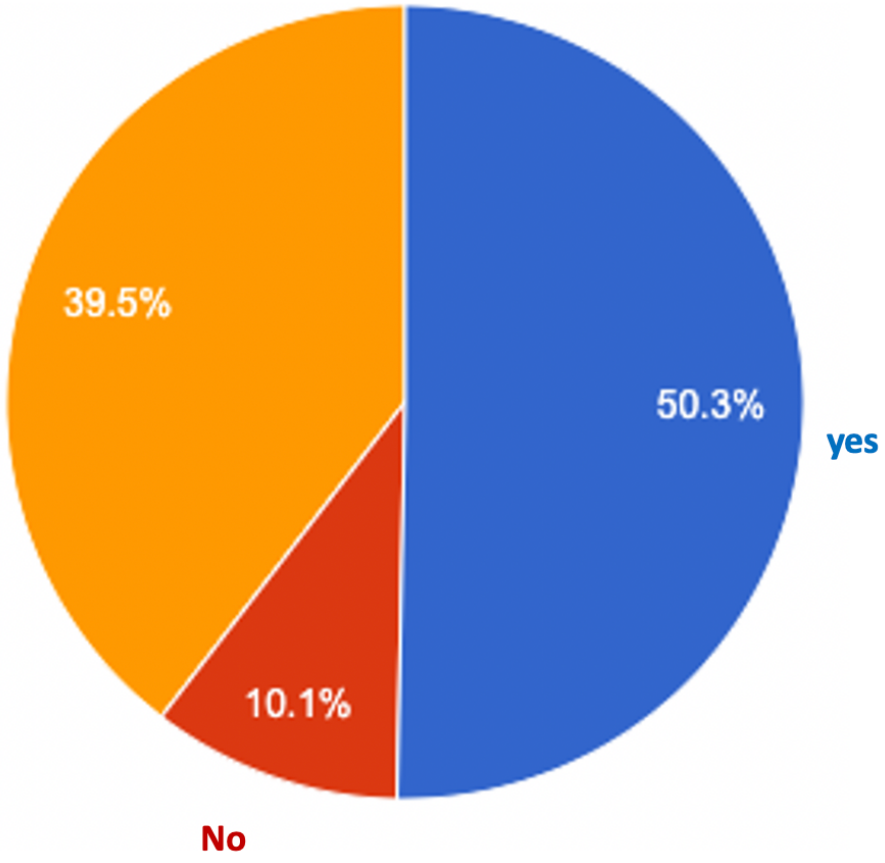
- Among those emergency courses related to emergency management, public simulation centres showed a tendency to have fewer number of courses in this field. On the other hand, scientific societies had a tendency to have more courses related to this topic. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution in the field of emergency management

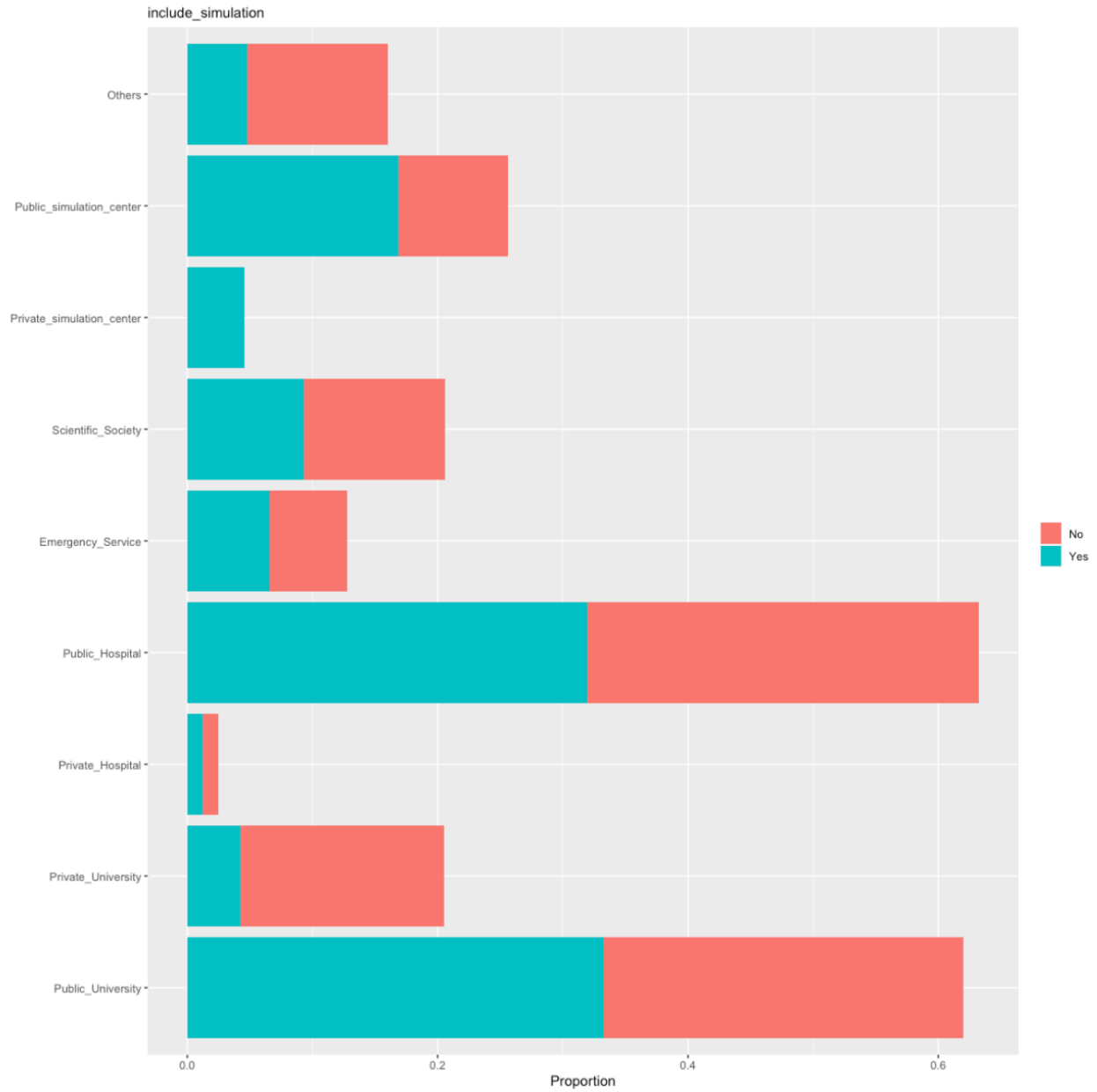
	No	Yes	p	test
n	645	144		
Public_University = 1 (%)	209 (32.4)	57 (39.6)	0.121	
Private_University = 1 (%)	43 (6.7)	10 (6.9)	1.000	
Private_Hospital = 1 (%)	9 (1.4)	0 (0.0)	0.321	
Public_Hospital = 1 (%)	234 (36.3)	39 (27.1)	0.045	
Emergency_Service = 1 (%)	31 (4.8)	16 (11.1)	0.007	
Scientific_Society = 1 (%)	41 (6.4)	28 (19.4)	<0.001	
Private_simulation_center = 1 (%)	17 (2.6)	10 (6.9)	0.020	
Public_simulation_center = 1 (%)	74 (11.5)	2 (1.4)	<0.001	
Others = 1 (%)	61 (9.5)	7 (4.9)	0.107	

- When it comes to the use of simulation, more than half of the courses included simulation. Please see the pie chart below.



Pie chart showing the percentages of courses including simulation (blue), not including simulation (red), with information unavailable (yellow)

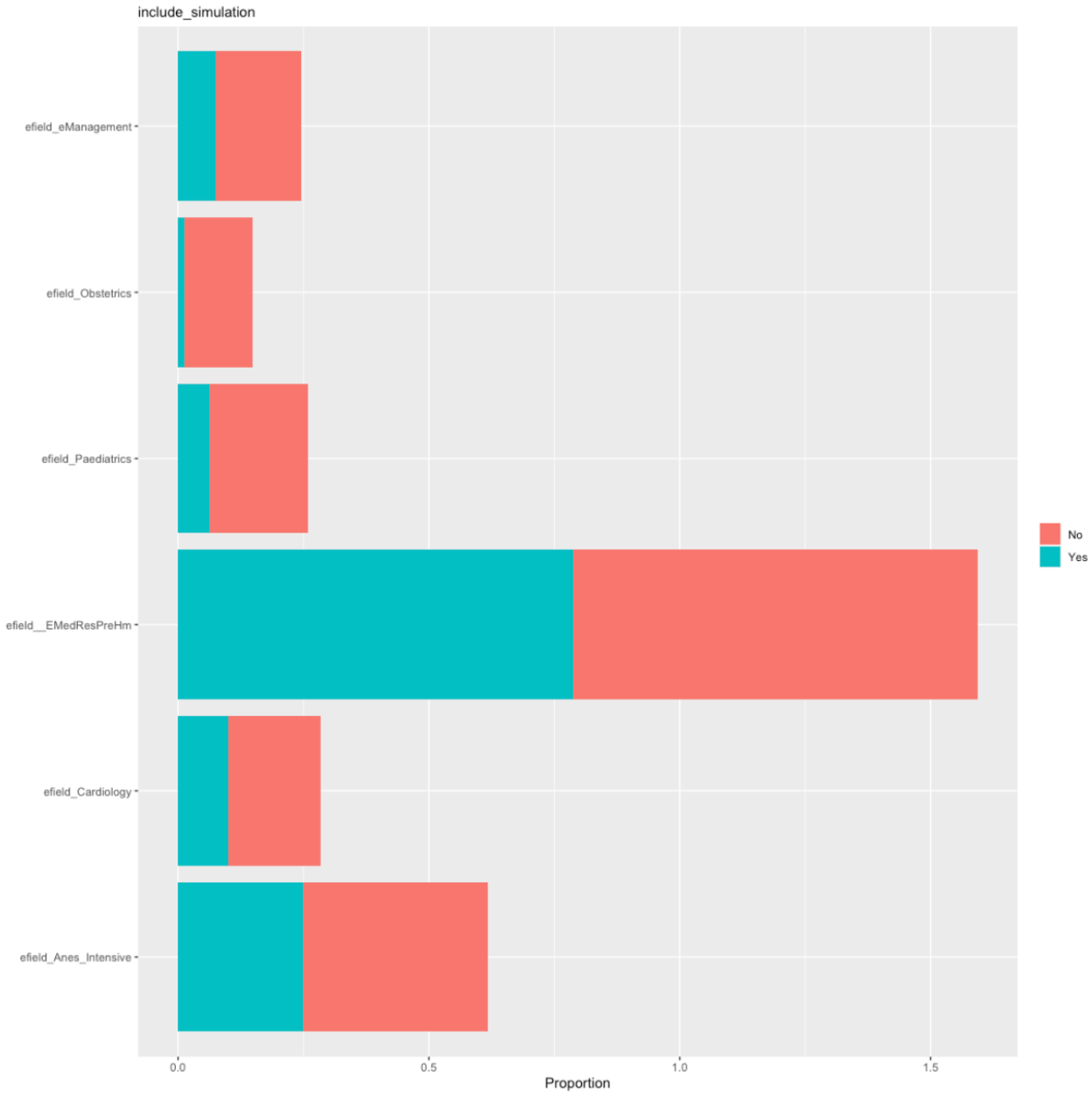
- Private universities showed a statistically significant tendency not to include simulation in their emergency offer. Please see the bar chart and table below.



Bar chart showing the proportion of courses by institution including and not including simulation

	No	Yes	p	test
n	80	397		
Public_University = 1 (%)	23 (28.7)	132 (33.2)	0.514	
Private_University = 1 (%)	13 (16.2)	17 (4.3)	<0.001	
Private_Hospital = 1 (%)	1 (1.2)	5 (1.3)	1.000	
Public_Hospital = 1 (%)	25 (31.2)	127 (32.0)	1.000	
Emergency_Service = 1 (%)	5 (6.2)	26 (6.5)	1.000	
Scientific_Society = 1 (%)	9 (11.2)	37 (9.3)	0.744	
Private_simulation_center = 1 (%)	0 (0.0)	18 (4.5)	0.105	
Public_simulation_center = 1 (%)	7 (8.8)	67 (16.9)	0.096	
Others = 1 (%)	9 (11.2)	19 (4.8)	0.047	

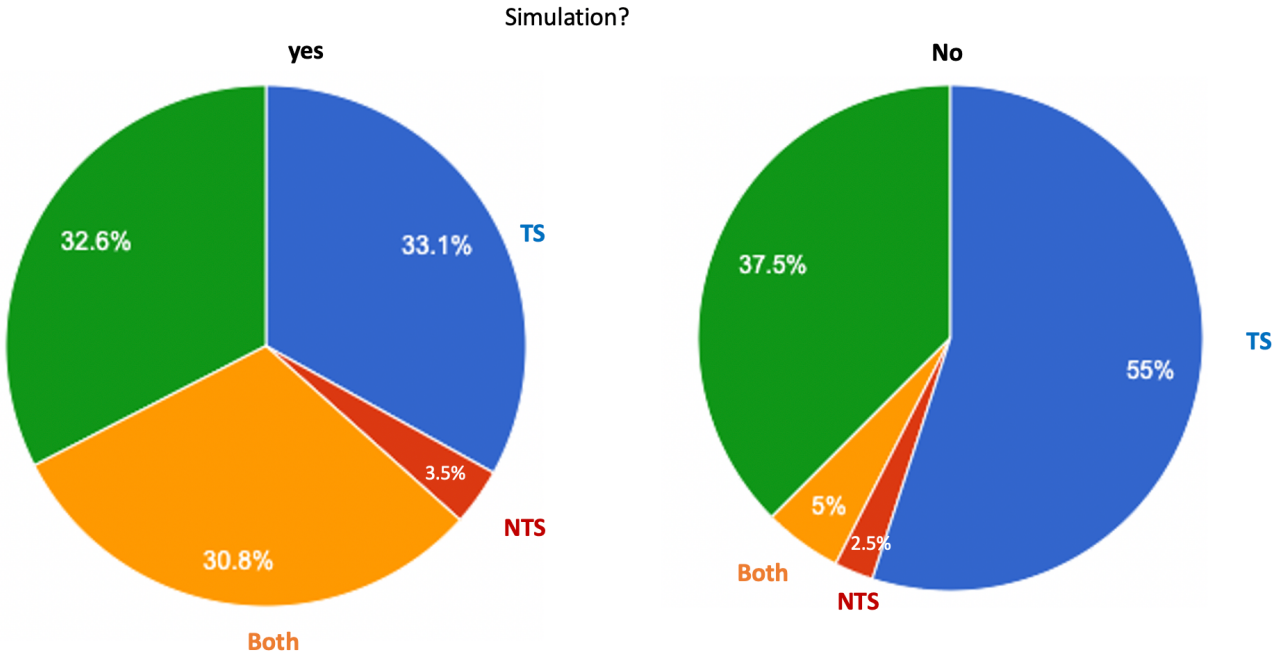
- There was no difference in the use of simulation among the different emergency fields. Please see the bar chart and table below.



Bar chart showing the proportion of courses by emergency field including and not including simulation

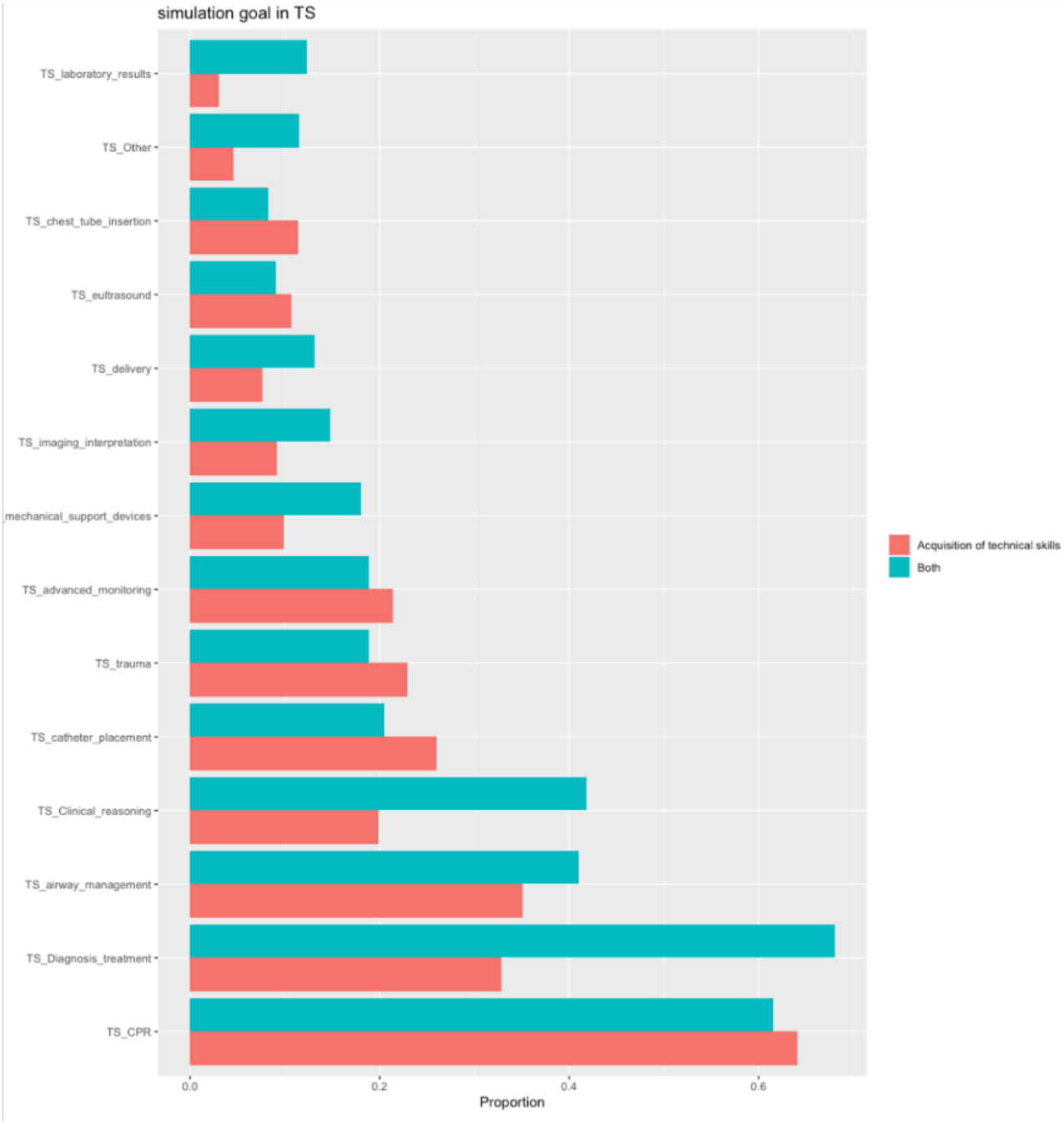
	No	Yes	p	test
n	80	397		
efield_Anes_Intensive = Yes (%)	20 (25.0)	146 (36.8)	0.059	
efield_Cardiology = Yes (%)	8 (10.0)	73 (18.4)	0.097	
efield__EMedResPreHm = Yes (%)	63 (78.8)	320 (80.6)	0.821	
efield_Paediatrics = Yes (%)	5 (6.2)	78 (19.6)	0.006	
efield_Obstetrics = Yes (%)	1 (1.2)	54 (13.6)	0.003	
efield_eManagement = Yes (%)	6 (7.5)	68 (17.1)	0.045	

- The distribution of technical (TS) and non-technical skills (NTS) seems to be different between those courses including simulation and those that did not include simulation. Please see the pie chart below.



Pie chart showing the percentages of technical skills (TS), non-technical skills (NTS), both (TS and NTS) and information unavailable among courses including and not including simulation.

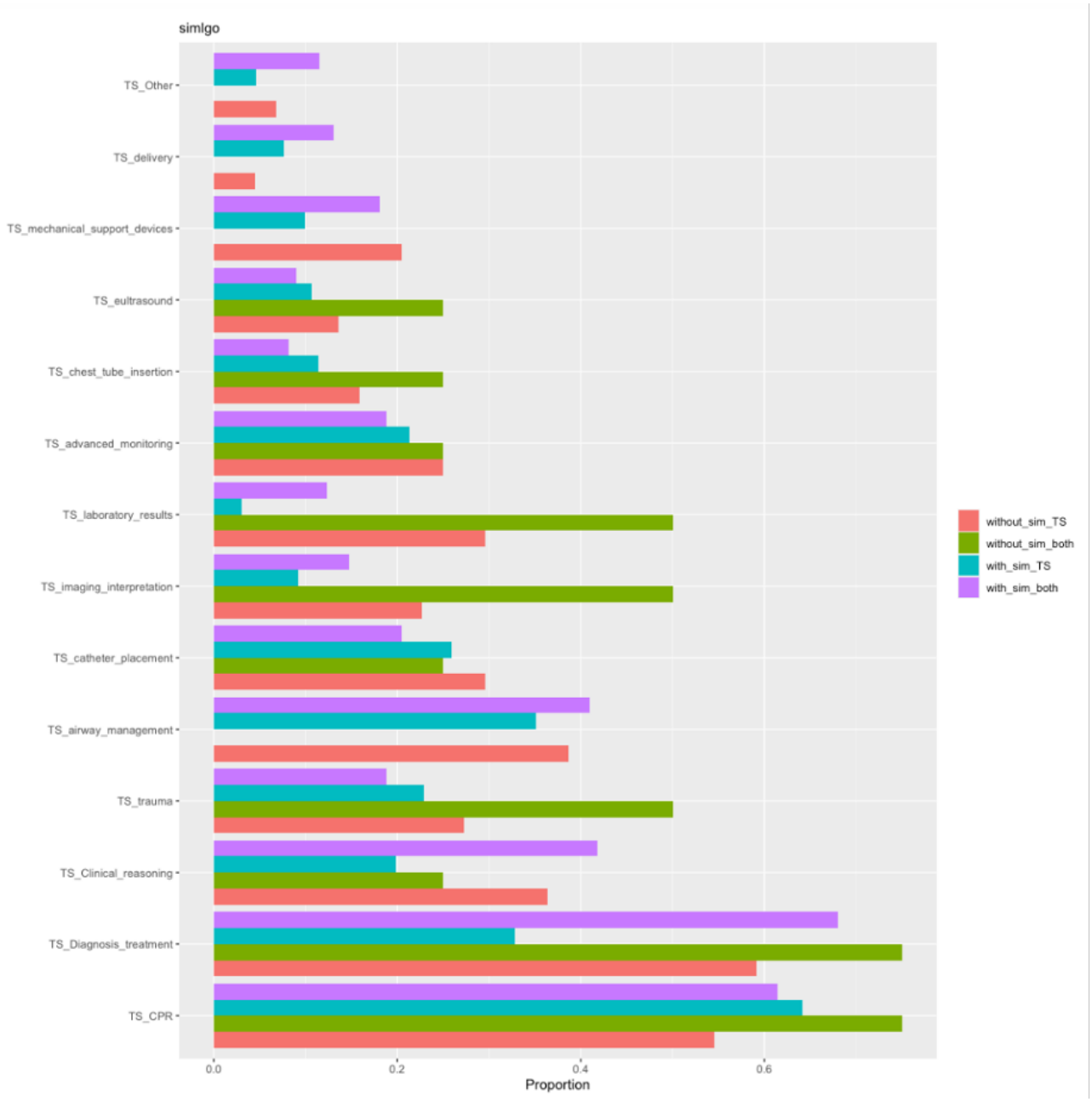
- Among those courses that included simulation, we analysed the effect of adding NTS on the goals of TS courses. TS courses with goals related to diagnosis and treatment, and clinical reasoning were statistically more frequent when NTS were also included. Please see the bar chart and table below.



Bar chart showing the proportion of different TS alone or in combination with NTS (both) in courses including simulation

	Acquisition.of.technical.skills	Both	p	test
n	131	122		
TS_Diagnosis_treatment = 1 (%)	43 (32.8)	83 (68.0)	<0.001	
TS_CPR = 1 (%)	84 (64.1)	75 (61.5)	0.760	
TS_trauma = 1 (%)	30 (22.9)	23 (18.9)	0.525	
TS_airway_management = 1 (%)	46 (35.1)	50 (41.0)	0.406	
TS_catheter_placement = 1 (%)	34 (26.0)	25 (20.5)	0.380	
TS_chest_tube_insertion = 1 (%)	15 (11.5)	10 (8.2)	0.512	
TS_eultrasound = 1 (%)	14 (10.7)	11 (9.0)	0.815	
TS_delivery = 1 (%)	10 (7.6)	16 (13.1)	0.220	
TS_mechanical_support_devices = 1 (%)	13 (9.9)	22 (18.0)	0.092	
TS_imaging_interpretation = 1 (%)	12 (9.2)	18 (14.8)	0.238	
TS_laboratory_results = 1 (%)	4 (3.1)	15 (12.3)	0.011	
TS_advanced_monitoring = 1 (%)	28 (21.4)	23 (18.9)	0.732	
TS_Clinical_reasoning = 1 (%)	26 (19.8)	51 (41.8)	<0.001	
TS_Other = 1 (%)	6 (4.6)	14 (11.5)	0.072	

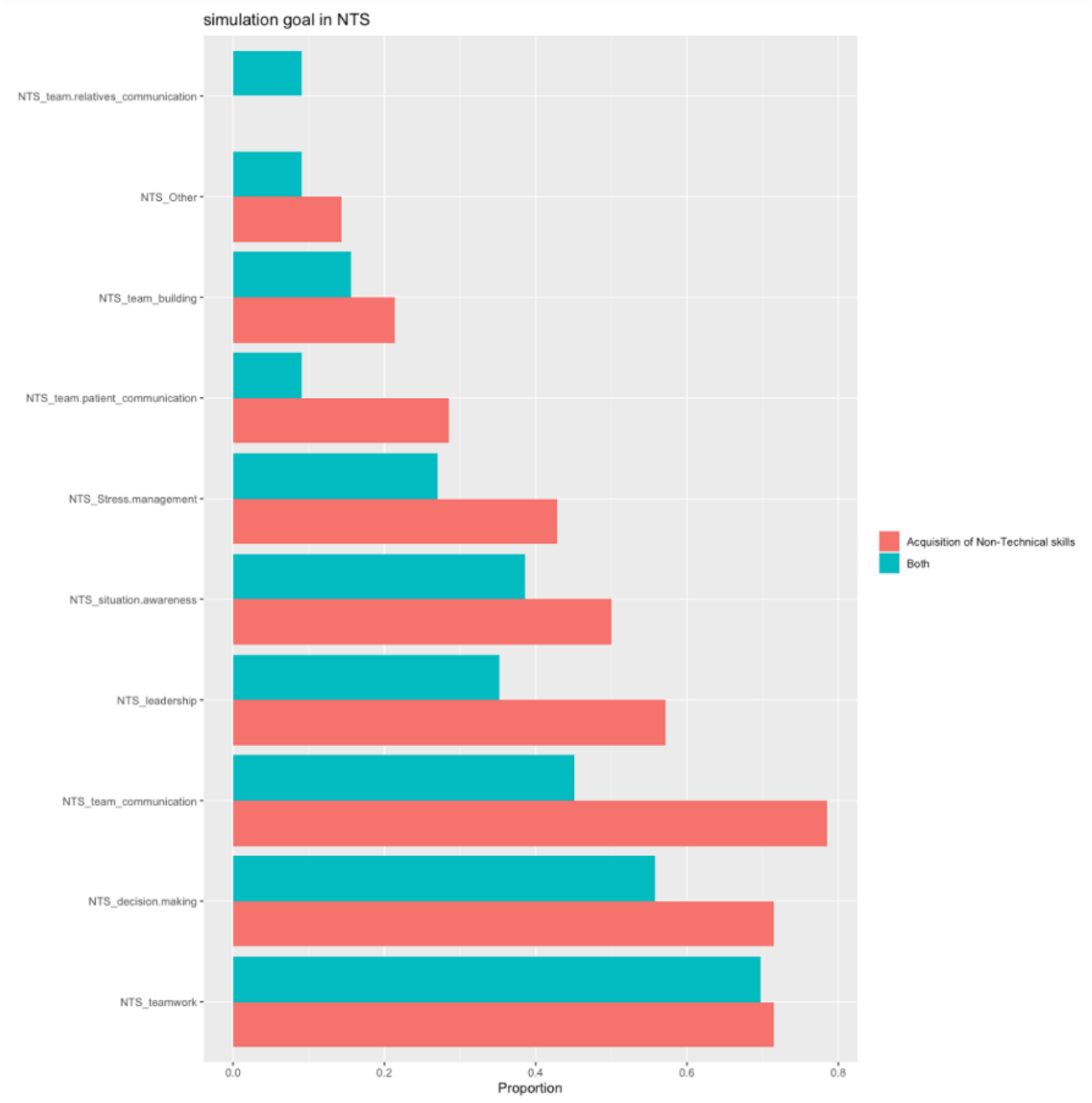
- We analysed the effect of adding NTS on the goals of TS courses (courses including and not including simulation). TS courses with goals related to diagnosis and treatment, and laboratory results were statistically more frequent when NTS were also included. Please see the bar chart and table below.



Bar chart showing the proportion of different TS alone or in combination with NTS (both) in courses including and not including simulation

	without_sim_TS	without_sim_both	with_sim_TS	with_sim_both	p	test
n	44	4	131	122		
TS_Diagnosis_treatment = 1 (%)	26 (59.1)	3 (75.0)	43 (32.8)	83 (68.0)	<0.001	
TS_CPR = 1 (%)	24 (54.5)	3 (75.0)	84 (64.1)	75 (61.5)	0.664	
TS_trauma = 1 (%)	12 (27.3)	2 (50.0)	30 (22.9)	23 (18.9)	0.352	
TS_airway_management = 1 (%)	17 (38.6)	0 (0.0)	46 (35.1)	50 (41.0)	0.338	
TS_catheter_placement = 1 (%)	13 (29.5)	1 (25.0)	34 (26.0)	25 (20.5)	0.611	
TS_chest_tube_insertion = 1 (%)	7 (15.9)	1 (25.0)	15 (11.5)	10 (8.2)	0.408	
TS_eultrasound = 1 (%)	6 (13.6)	1 (25.0)	14 (10.7)	11 (9.0)	0.654	
TS_delivery = 1 (%)	2 (4.5)	0 (0.0)	10 (7.6)	16 (13.1)	0.248	
TS_mechanical_support_devices = 1 (%)	9 (20.5)	0 (0.0)	13 (9.9)	22 (18.0)	0.149	
TS_imaging_interpretation = 1 (%)	10 (22.7)	2 (50.0)	12 (9.2)	18 (14.8)	0.021	
TS_laboratory_results = 1 (%)	13 (29.5)	2 (50.0)	4 (3.1)	15 (12.3)	<0.001	
TS_advanced_monitoring = 1 (%)	11 (25.0)	1 (25.0)	28 (21.4)	23 (18.9)	0.846	
TS_Clinical_reasoning = 1 (%)	16 (36.4)	1 (25.0)	26 (19.8)	51 (41.8)	0.002	
TS_Other = 1 (%)	3 (6.8)	0 (0.0)	6 (4.6)	14 (11.5)	0.199	

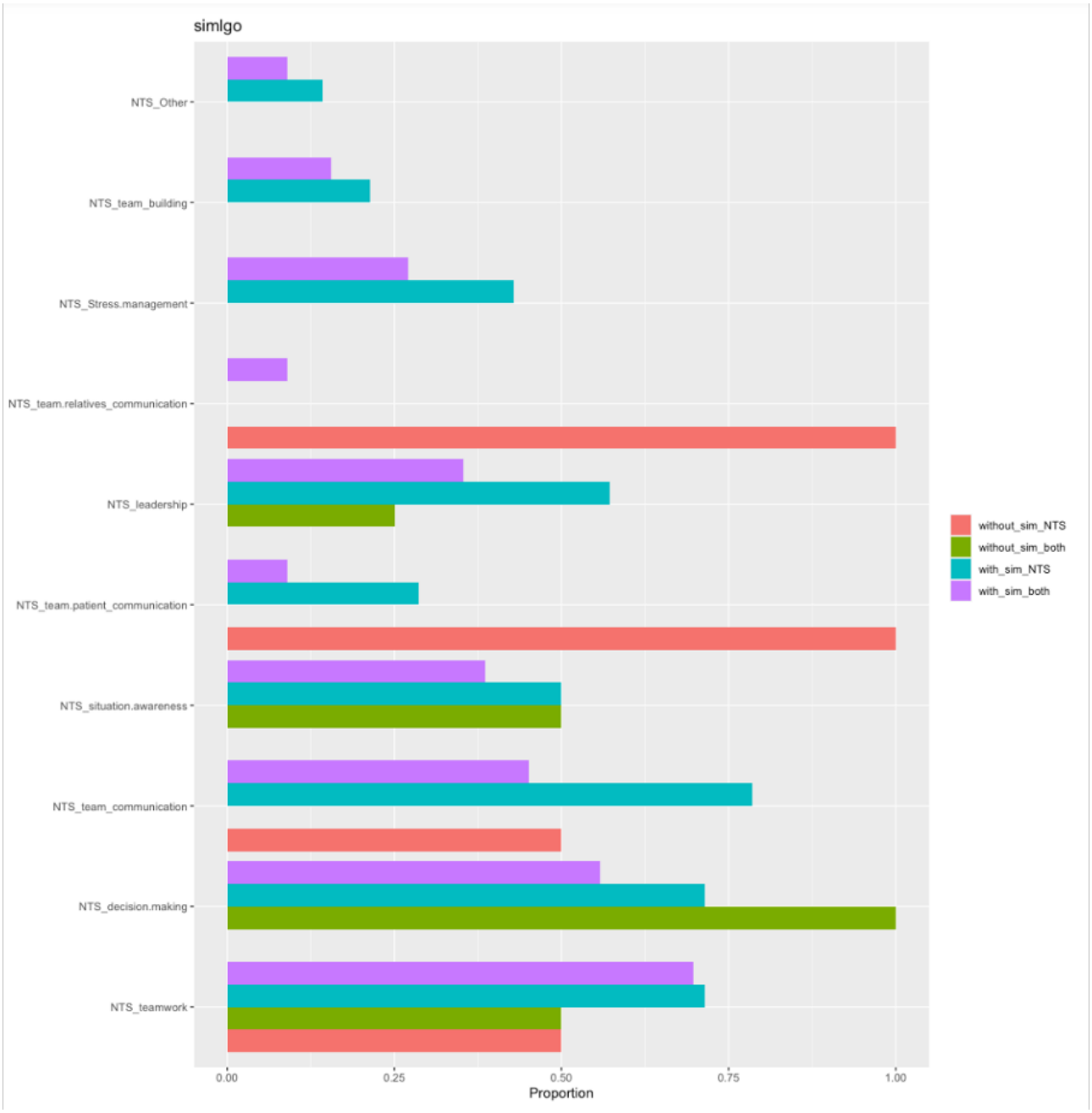
- Among those courses that included simulation, we analysed the effect of adding TS on the goals of NTS courses. There was no effect of adding TS on the goals NTS courses. Please see the bar chart and table below.



Bar chart showing the proportion of different NTS alone or in combination with TS (both) in courses including simulation

	Acquisition.of.Non.Technical.skills	Both	p	test
n	14	122		
NTS_leadership = 1 (%)	8 (57.1)	43 (35.2)	0.190	
NTS_teamwork = 1 (%)	10 (71.4)	85 (69.7)	1.000	
NTS_situation awareness = 1 (%)	7 (50.0)	47 (38.5)	0.587	
NTS_decision making = 1 (%)	10 (71.4)	68 (55.7)	0.401	
NTS_Stress management = 1 (%)	6 (42.9)	33 (27.0)	0.354	
NTS_team_communication = 1 (%)	11 (78.6)	55 (45.1)	0.036	
NTS_team-patient_communication = 1 (%)	4 (28.6)	11 (9.0)	0.078	
NTS_team-relatives_communication = 1 (%)	0 (0.0)	11 (9.0)	0.513	
NTS_team_building = 1 (%)	3 (21.4)	19 (15.6)	0.857	

- We analysed the distribution of NTS goals across all the courses. NTS goals related to team-patient communication and team-relative communication showed a statistically significant tendency to be less frequent among those courses including simulation. Please see the bar chart and table below.



Bar chart showing the proportion of different NTS alone or in combination with TS (both) in courses including (with_sim) and not including (without_sim) simulation

	without_sim_NTS	without_sim_both	with_sim_NTS	with_sim_both	p	test
n	2	4	14	122		
NTS_leadership = 1 (%)	0 (0.0)	1 (25.0)	8 (57.1)	43 (35.2)	0.258	
NTS_teamwork = 1 (%)	1 (50.0)	2 (50.0)	10 (71.4)	85 (69.7)	0.783	
NTS_situation awareness = 1 (%)	0 (0.0)	2 (50.0)	7 (50.0)	47 (38.5)	0.535	
NTS_decision making = 1 (%)	0 (0.0)	4 (100.0)	10 (71.4)	68 (55.7)	0.074	
NTS_Stress management = 1 (%)	0 (0.0)	0 (0.0)	6 (42.9)	33 (27.0)	0.267	
NTS_team_communication = 1 (%)	1 (50.0)	0 (0.0)	11 (78.6)	55 (45.1)	0.025	
NTS_team-patient_communication = 1 (%)	2 (100.0)	0 (0.0)	4 (28.6)	11 (9.0)	<0.001	
NTS_team-relatives_communication = 1 (%)	2 (100.0)	0 (0.0)	0 (0.0)	11 (9.0)	<0.001	
NTS_team_building = 1 (%)	0 (0.0)	0 (0.0)	3 (21.4)	19 (15.6)	0.688	

Limitations

This analysis has been performed as desk research and, accordingly, the results rely on the availability and quality of the published information. The desk research was based on information available on the internet to standardise and increase the rate of task completion. This intrinsic aspect of the desk research may lead to information bias, with the possibility of only collecting and analysing the information available on the internet.

Conclusions

- Most of the offer came from public universities and hospitals
- Public hospitals, public universities, and public and private simulation centres showed a statistically significant difference offer across the countries participating in SAFETY. Spain tended to have a higher number of courses offered by these institutions.
- Undergraduate nurses and physicians had the lower percentage of courses targeting them.
- Public universities showed a statistically significant tendency to have more courses targeting undergraduate physicians and nurses.
- Public hospitals showed a statistically significant trend to have fewer courses targeting undergraduate physicians and prehospital emergency staff.
- Private universities showed a statistically significant tendency to have more courses targeting nurses.
- Public and private simulation centres showed a statistically significant trend to have more courses targeting prehospital emergency staff.
- Courses related to anaesthesiology-intensive care, obstetrics, cardiology, and emergency management showed a statistically significant tendency to be more frequent in Spain.

- Public hospitals showed a statistically significant tendency to have more courses related to anaesthesiology-intensive care, cardiology, and paediatrics.
- Public simulation centre showed a statistically significant tendency to have fewer courses related to emergency management.
- Half of the emergency educational offer included simulation
- It seems that the use of simulation allows to approach NTS alone and with TS more frequently than courses without simulation
- Courses were more likely to target skills related to “diagnosis and treatment” and” clinical reasoning” if they were linked to NTS.
- There was a significant tendency of courses than included simulation not to target “team-patient communication” and “team-relatives communication”

These results will be further analysed alongside the educational needs results during next steps of the project.

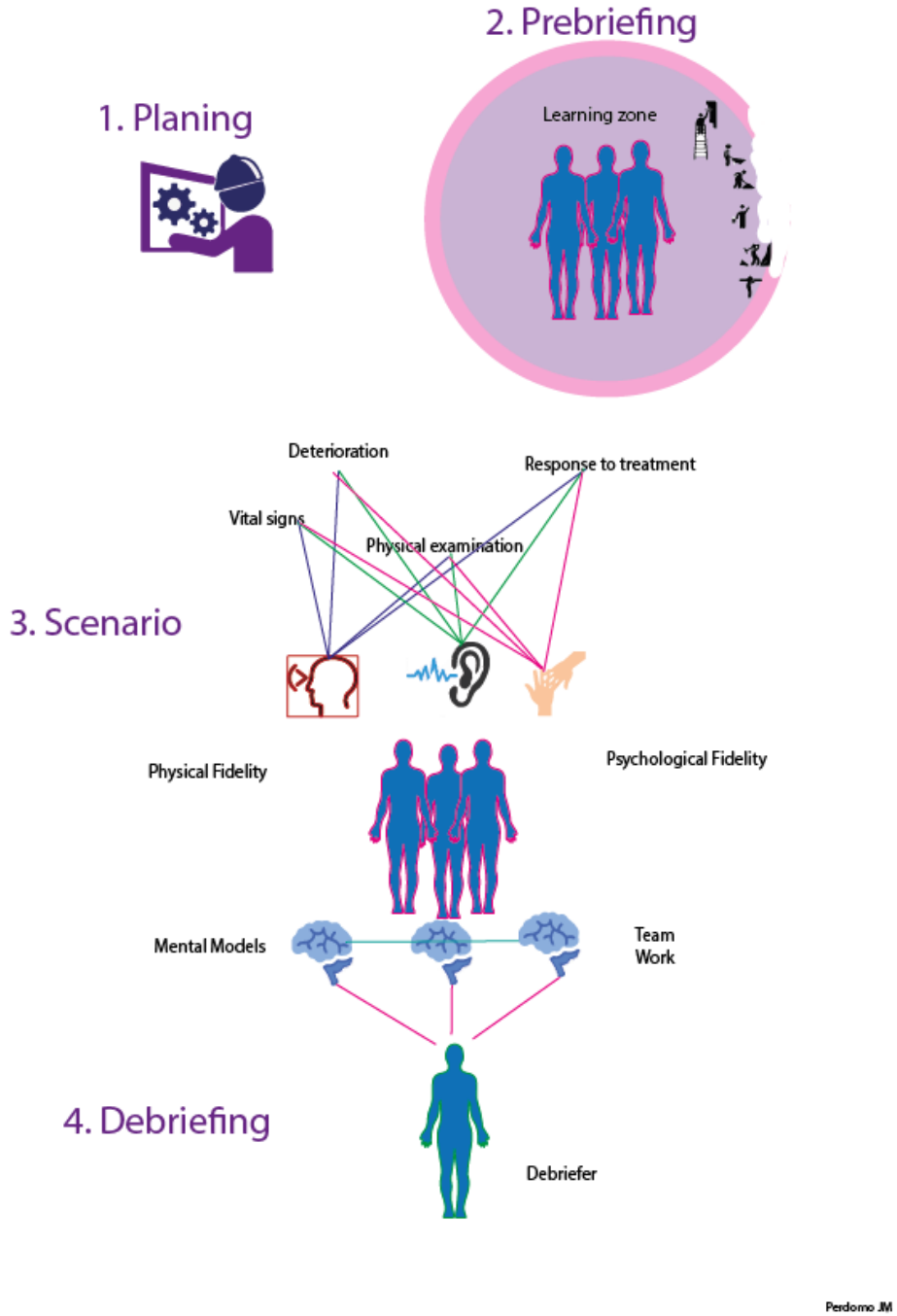
RESEARCH ON GOOD PRACTICES

Definition

According to the European Union, a **good practice** encompasses a process or a methodology that represents an effective way of achieving a specific objective, one that has been proven to work well and produce expected results, and it´s therefore recommended as a model or as a useful example.

Model for Good Practice Collection

The Hospital Clínic collected current good practices involved in the process of planning simulation scenarios, performing prebriefing, scenarios and debriefing. Additionally, a filth subgroup of good practices related to evaluation and improvement was added.



Source of Information

-Good practices from Take The Wind, Alpha Medical Concepts and Laerdal
-Good practices from:

- ASSOCIATION FOR SIMULATED PRACTICE IN HEALTHCARE (ASPiH)
- AN INTERNATIONAL ASSOCIATION FOR MEDICAL EDUCATION (amee)
- SOCIETY FOR SIMULATION IN EUROPE (SESAM)
- HAUTE AUTORITÉ SANTÉ (HAS)
- INTERNATIONAL NURSING ASSOCIATION for CLINICAL SIMULATION and LEARNING (INACSL)

Duties

Partner: **Hospital Clinic**
Responsible Person**: Juan Perdomo** & colleagues
Tasks:

- Desk Research on Good Practices
- Analysis and results

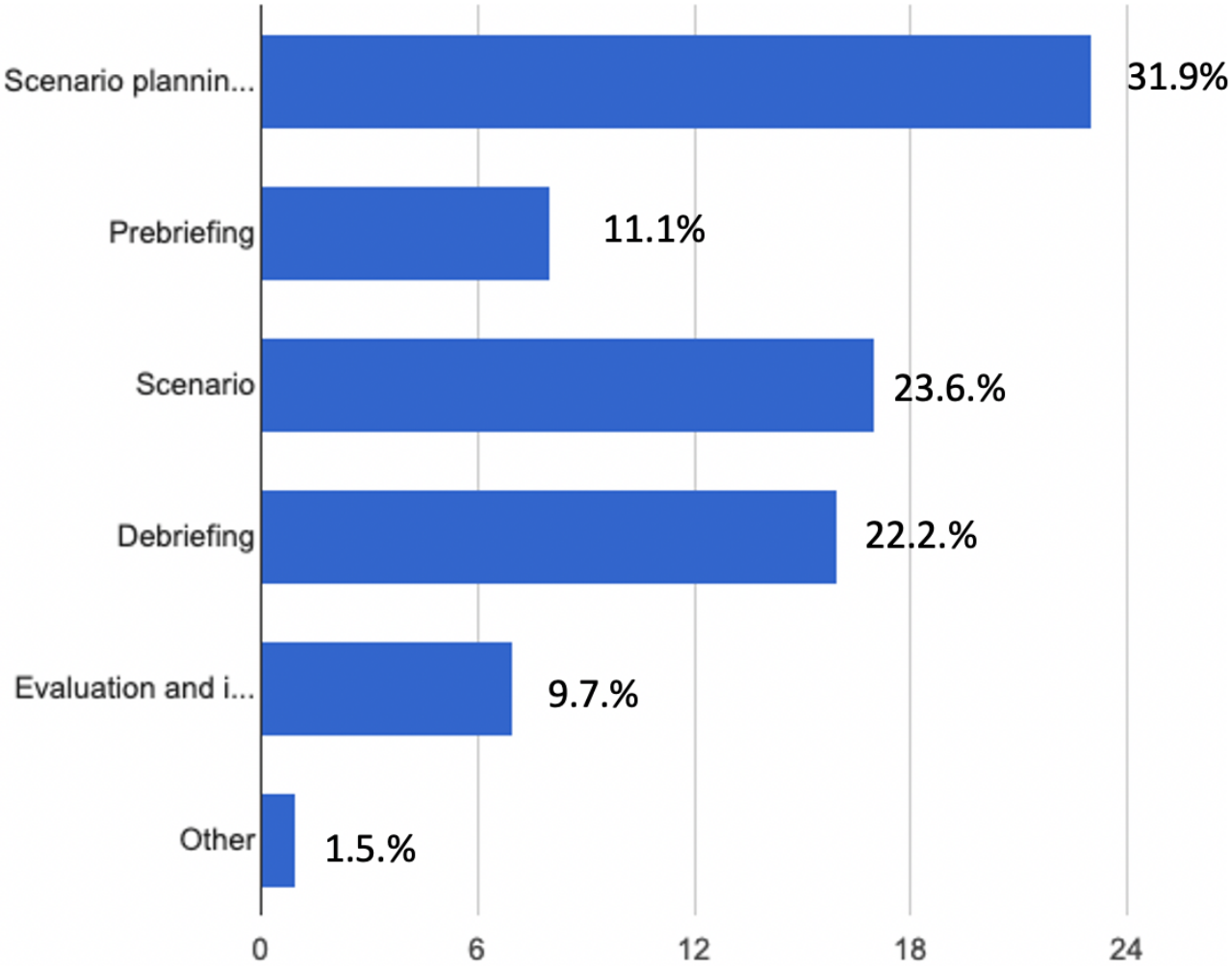
Partner: **Take The Wind**
Tasks: Good Practice provider

Partner: **Laerdal**
Tasks: Good Practice provider

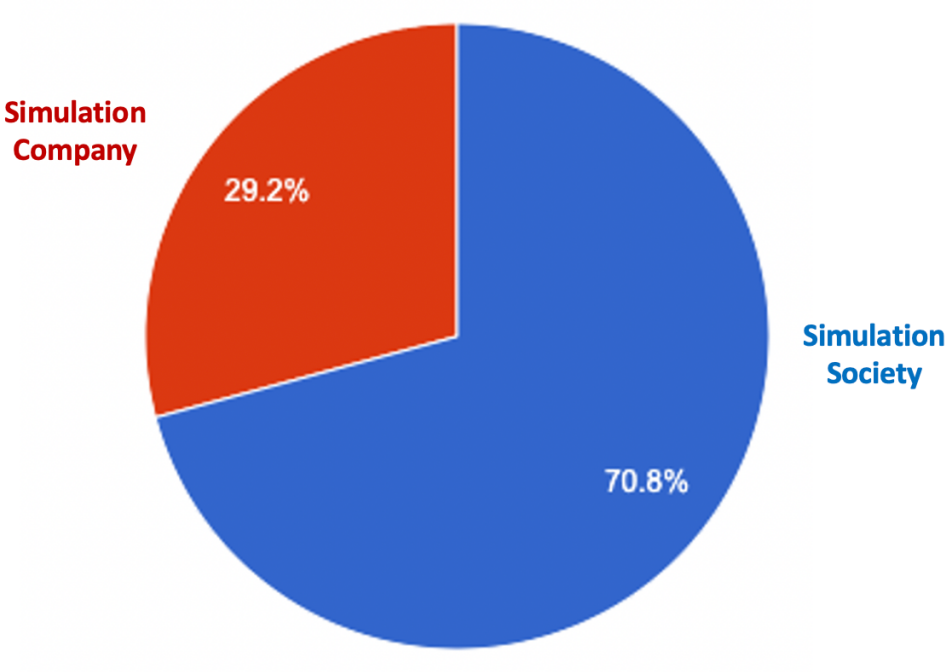
Partner: **Alpha Medical Concepts**
Tasks: Good Practice provider

Results

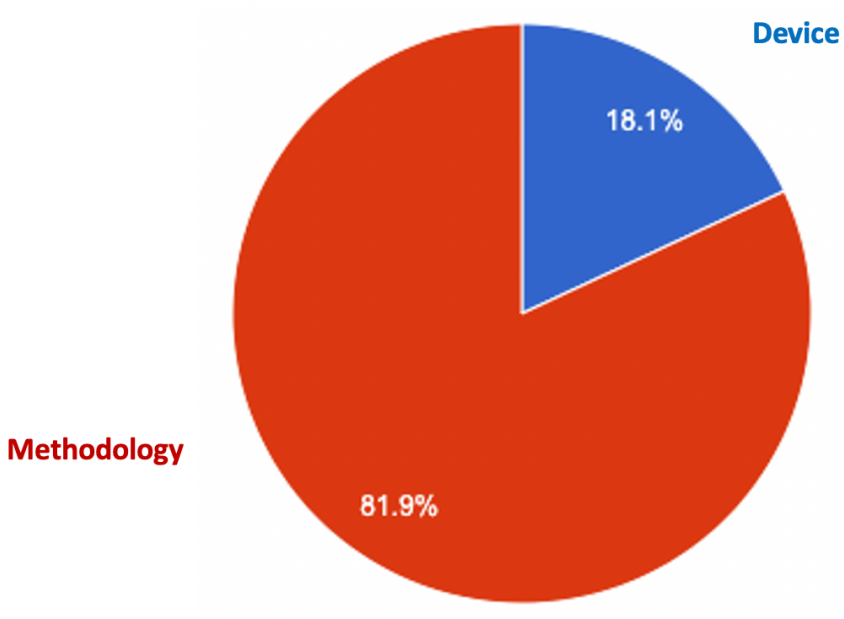
- Current published good practices show a heterogenous distribution across the different aspects of simulation (scenario planning, prebriefing, scenario, debriefing, evaluation, and improvement). Please see the bar chart below.



- Most of the current good practices come from simulation societies. Please see the pie chart below.



- Most of the current good practices encompass a methodology. Please see the pie chart below.



Please see below the main good practices gathered during the desk research.

- **Good practices related to the scenario planning**
    - Link between daily clinical practice and scenario educational targets is recommended (methodology)
    - Scenario based on learner's background and context is recommended (methodology)
    - Simulation-based education programmes should be developed in alignment with formal curriculum, mapping or learning/training needs analysis undertaken in clinical or educational practice (methodology)
    - Simulation should be integrated into the existing curriculum rather than including simulation as additional, independent exercises (methodology)
    - There should be variation in the difficulty or complexity of the scenarios (methodology)
    - Domains (cognitive/affective/psychomotor) of learning involved in the activity should be
      described using educational theory (Bloom's taxonomy or higher). This encourages faculty to aim to provide holistic teaching of the skill (methodology)
    - The cycle of learning should be considered when planning simulation (methodology)
        - Knowledge acquisition
        - Skills proficiency
        - Decision making
        - Simulation in teams
        - Clinical experience
    - Simulation programme should include human factor approach (methodology)
    - Integration of desire of learning, individual roles and priority of the institution is recommended (methodology)
    - Multidisciplinary simulation should be promoted. Those who work together should learn together (methodology)
    - Link between the educational goal and the specific simulation technique to be used is recommended (methodology)
    - Definition of a realistic environment to achieve the educational objectives is recommended (methodology)
    - Definition of appropriate fidelity to achieve the learning objectives/outcomes is recommended (methodology)
        - Conceptual (i.e., vital signs and lab results reflect the diagnosis)
        - Physical/Environmental (i.e., setting of in-situ versus simulation lab, equipment, tools, sensory props, manikin, moulage).
        - Psychological (i.e., evokes underlying emotions, beliefs, and self-awareness of learners).
    - Link between the educational goal and the specific simulation device (task trainer, manikin, virtual reality, etc) is recommended (methodology)
    - Identification of appropriate simulation modality to meet the learning objectives/outcomes is recommended (methodology):
        - Low technology (i.e., task trainer, case study, role play).

        - High technology (i.e., high complexity simulation manikin mimicking human body functions).
        - Simulated Patient (i.e., live patient versus virtual patient technology).
        - Virtual/Augmented Simulation (i.e., three-dimensional (3D) immersion using Head-mounted Display VR (HMD VR), haptic enhanced task trainers, computer screen-based, immersive rooms, interactive clinical case scenarios with branching case structure).
    - Instructors should be properly assigned to the scenario, based on their experience, and learning goals of the course. An appropriate ratio instructors/learner is recommended (methodology)
    - Clear standards of the criteria to be a simulation faculty member are recommended (methodology)
    - Trainers should have specific training in simulation (methodology)
    - The maintenance of a safety learning environment is the uttermost priority of trainers (methodology)
    - Trainers should have a validation of experience in simulation recognized by the infrastructure manager and / or the educational and / or scientific manager (methodology)
    - Trainers must have pedagogical experience enabling them to integrate simulation into a program (methodology)
    - Trainers must be experts on the specific scenario subject (methodology)
    - Senior trainers should be involved in simulation regularly (6 or more simulation sessions per year) (methodology)
    - The skills of trainers should be regularly assessed (methodology)
    - Instructors should have a continue personal development program (methodology)
    - Junior trainers should attend to an introductory course which includes adult learning theories, simulation terminology, simulation technical aspects (methodology)
    - Junior trainers should have specific training in debriefing. As debriefing, is recognised to be the most important of learning in simulation (methodology)
    - Junior trainers should observe or co-facilitate existing courses alongside a more experience instructor (methodology)
    - Junior trainers should have a streamlined process to become senior instructor (methodology)
    - Junior trainers must be supervised by the infrastructure manager (methodology)
    - Simulation instructors should participate in ongoing continuing educational offerings, and/or targeted work with an experienced mentor (methodology)
    - Proper location/physical space should be ensured for the prebriefing, scenario and debriefing (methodology)
    - In case of in-situ simulation. The costs involved in-situ simulation should be considered (methodology)
    - In-situ refresher training should be considered: Repetitive sessions known as low dose, High frequency training has been demonstrated not only to maintain competence, but also to improve performance (methodology)

- To perform a pilot test simulation experience before full implementation is recommended (methodology)
- BI studio: This tool helps the instructor to select and/or set scenarios according to the students' needs or goals meant to be achieved. The results and choices are done according to the Body Interact app (device, Take The Wind SA)
- During the planning period is recommended (methodology):
  - To define the target learner population
  - To define educational goals and their evaluation elements
  - To define the material and equipment required according to the desire realism
  - To define the human capital required
  - To define scenario duration and session sequence
  - To define the bibliography required before, during and after the scenario

- **Good practices related to prebriefing**
  - Promotion of psychological safety by having written statements and policies on confidentiality is recommended (written consent by participants) (methodology)
  - An explanation of how the session is planned to happen is recommended (methodology)
  - A reminder of confidentiality and fiction principles is recommended (methodology)
  - A reminder of ethical rules and professionalism contract is recommended (methodology)
  - An exposure of the type of technology to be used is recommended (methodology)
  - A reminder of other psychological elements to make the participants feel comfortable: absence of judgment, absence of intentional tricks; is recommended (methodology)
  - Participants' expectations should be explored (methodology)
  - Logistic factors should be conveyed (methodology)
  - It is recommended that roles and what to expect from participants, instructors, collaborators, observers, and technicians are explained (methodology)
  - An introduction to the simulated environment should be considered (methodology)
  - Writing o recording prebriefing plan should be considered (methodology)
  - Instructors should be competent performing prebriefing (methodology)
  - Prebriefing should be adapted to learning goals (methodology)
  - Prebriefing should be adapted to participant's experience and knowledge (methodology)
  - Preparation material should be provided to participants. The use of adult learning theories to prepare this material is recommended (methodology)
  - The possibility of recording and/or observation by others (peers, external staff, etc) should be discussed (methodology)

- **Good practices related to the scenario**
    - Dedicated personnel should be responsible for the maintenance of equipment and associated records (simulation technician) (methodology)
    - Simulation technicians (methodology)
        - Should be competent in equipment, maintenance, and troubleshooting
        - Should be aware of the adult learning theories
        - Should maintain a safe learning environment
        - Should be involved in the designing of simulation cases
    - Consumables used in simulation must be clearly identified as no longer usable for patients. This is especially important in in-situ simulation (methodology)
    - Equipment used during in-situ simulation activity should be replaced to ensure that the clinical environment and drug stocks —where relevant— are left in a safe condition for continued delivery of patient care (methodology)
    - To keep updated the inventory of available equipment and its maintenance, as well as the stocks of consumables is recommended (methodology)
    - The recycling of consumables should be planned in accordance with the regulations (methodology)
    - It is recommended to maintain a competency-based training program for personnel to operate applicable equipment such as (methodology):
        - Simulator equipment
        - Medical equipment
        - Audio-visual equipment
        - Electronic health record systems
    - The equipment should provide the same experience to all participants (methodology)
    - It is recommended to deliver cues to draw attention of the participants to critical or noncritical information related to the context of the scenario or case (methodology)
    - A manual should be maintained to ensure consistency between design and delivery of the
      programme and reproducibility among instructors (methodology)
    - Testing of all simulation equipment should be undertaken before and after every session (methodology)
    - Body Interact is an interactive digital simulator for problem-solving and clinical reasoning using virtual patients. This tool has different patient options and ranges of difficulties. It also provides feedback on performance (device, Take The Wind SA)
    - QCPR feedback technology can be used to provide real time feedback to participant during scenario (device, Laerdal)
    - The SkillGuide can be used to provide participants with compression-ventilation measurement and feedback during CPR scenarios (device, Laerdal)
    - CPRmeter App can be used to provide real-time coaching during the scenario (device, Laerdal)
    - VitalsBridge: The use VitalsBridge during simulation training can present vital signs onto a commercially available patient monitor (device, Laerdal)

- ASL 5000™ Lung Solution: This is a breathing simulator intended for high-fidelity ventilation management. It can simulate any respiratory condition you may encounter, on any ventilator in any mode of ventilation (device, Laerdal)
- TruVent: This virtual simulation app can be used to teach ventilation management safely without the need for a ventilator or a simulator (device, Laerdal)

- **Good practices related to debriefing**
  - It is recommended to implement quality management processes to guarantee psychological safety and avoidance of inappropriate false reassurance (methodology)
  - Participants should feel comfortable during debriefing (methodology)
  - Debriefing should be learner-centred (methodology)
  - To maintain coherence between planned learning goals and debriefing (methodology)
  - Debriefing should be structured —incorporating various phases— but flexible (methodology)
  - The debriefing structure may follow one of the most frequent models:
    - Debriefing for Meaningful Learning (DML)
    - Debriefing with Good Judgment
    - Diamond
    - Gather, Analyse, Summarize (GAS)
    - PEARLS for System Integration (PSI) Frameworks
    - Promoting Excellence and Reflective Learning in Simulation (PEARLS)
    - Plus-Delta
    - Review the event, Encourage team participation, Focused feedback, Listen to each other, Emphasize key points, Communicate clearly, and Transform the future (REFLECT)
    - The 3D Model of Debriefing (Defusing, Discovering, and Deepening)
    - The Critical Incident Stress Debriefing Model
  - Objective performance indicators must be used (methodology)
  - It is recommended to promote discussions over teamwork (methodology)
  - Behaviours and interactions of a successful team must be subject to discussion (methodology)
  - The debriefing should occur immediately (less than 5 minutes) after simulation so that thoughts, feeling, and actions are captured without degradation or distortion (methodology)
  - Debriefing should be preceded by prebriefing (methodology)
  - Conclusions and goals should be recorded to facilitate subsequent debriefings (methodology)
  - Trainers should be trained in debriefing (methodology)
  - Debriefing should be conducted by skilled instructor (methodology). Evidence from research suggests that the perceived skills of the debriefer have the highest independent correlation to the perceived overall quality of the simulation experience

- The debriefer should include the following communication skills (methodology)
  - Socratic approach
  - Open-ended questions
  - Active listening
  - Non-judgmental demeanour
  - Silence to encourage learner(s) input
- SimCapture: This software can enhance the effectively management, recording, and assessment during simulation training, both on-site and in-situ. It captures audio, video, annotations, patient monitors, and simulator data in a single web-based interface (device, Laerdal)
- QCPR feedback technology can be used to facilitate debriefing (device, Laerdal)
- SimPad PLUS with SkillReporter can be used to facilitate real-time feedback, records data and calculates overall performance (device, Laerdal)
- The SkillGuide can provide quick review of CPR performance to use during debriefing (device, Laerdal)
- The CPRmeter can provide instant access to objective key performance metrics, leading to quick feedback and debriefing (device, Laerdal)
- BI studio: This tool helps the instructor to see the results of the student's performance. The results and choices are done according to the Body Interact app (device, Take The Wind SA)

- **Good practices related to evaluation and improvement**
  - Additional debriefing should be conducted once the simulation session is finished (methodology)
  - Implementation of learners' feedback is recommended (methodology)
  - It is recommended to have a strategy to implement changes based on the analysis of learners' feedback (e.g., using the PDCA-cycle) is recommended (methodology)
  - It is recommended to recognize the strengths and weaknesses of the established simulation program (methodology)
  - It is recommended to included different levels of Kirkpatrick's evaluation (methodology)
  - Outcomes should be clearly defined and evaluated. Metrics for improvement should also be defined. Assessment describes the measurement of learner outcomes whereas evaluation describes the measurement of course or program outcomes (methodology)
  - The existence of a referent responsible for coordinating research programs using simulation is recommended (methodology)
  - The list of trainers performing research or scientific activities within the simulation program as well as their participation in national or international scientific meetings should be regularly updated.

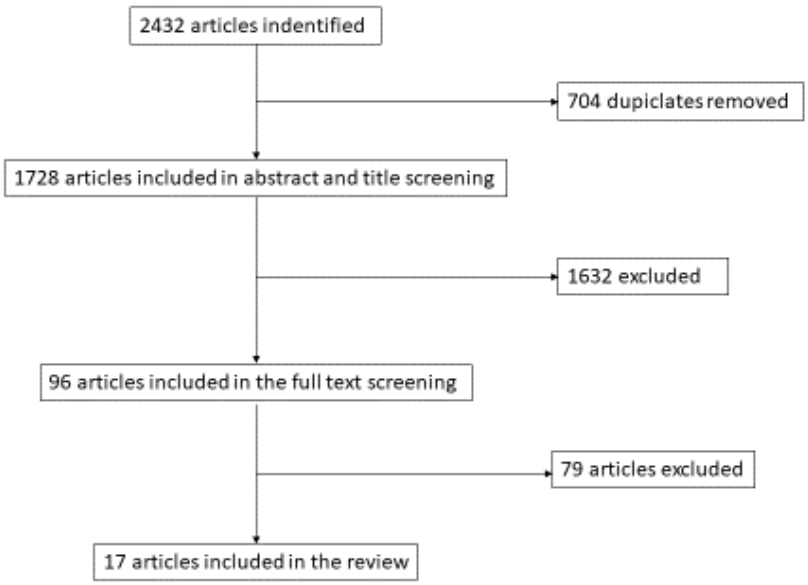
OPTIAMAL TEAM COMPOSITION IN EMERGENCY – A SYSTEMATIC REVIEW SIMULATION APPROACH FOR EDUCATION AND TRAINING IN EMERGENCY (SAFETY)

Resuscitation simulation training has been shown to improve interdisciplinary team performance, which can lead to improved patient outcome. (1) To optimize the benefits of simulation training it is essential that we identify the optimal composition of resuscitation teams so that we can reproduce these in training. Unfortunately, there exists little research on optimal team composition either for simulation or in real life. As part of the ERASMUS+ project 'Simulation Approach For Education and Training in emergency (SAFETY)' we have reviewed the current scientific literature and performed a systematic review to answer the question – what is the optimal team composition in medical emergencies?

Search Strategy

We searched the databases Embase, Medline and PsycInfo using the terms: team, trauma team, healthcare, treatment, emergency, medicine, and centre. These searches lead to 1565 results from Embase, 748 from Medline and 119 from PsycInfo. 704 duplicates were removed, leaving 1728 articles included in the initial abstract and title screening. After this screening, 1632 articles were removed as the main topic of the article was not optimal team composition in emergency, and the remaining 96 articles were included in full text screening. After full-text screening 17 articles were included in this analysis. See Fig 1. for study flow

Figure 1 Study Flow



Quality of the included studies

The methodological quality of the studies included in the review was graded using the Medical Education Research Study Quality Instrument (MERSQI). This instrument allows scoring of articles based on study design, sampling, data analysis and outcomes. (2) The MERSQI scores of the 17 articles included in the final report were 1.5, 2.5, 8, 10, 10.5 (2), 11 (4), 12, 12.5, 14. Four reports were deemed inappropriate for this scoring system.

Table 1 – Quality of the studies

Domain	MERSQI Item	Score	Studies. No. (%)
Study design	Single group cross-sectional or single group posttest only	1	8
	Single group pretest & posttest	1,5	1
	Nonrandomized, 2 groups	2	1
	Randomized controlled trial	3	
Sampling	*Institutions studied*:		
	1	0,5	7
	2	1	1
	3	1,5	4
	Response rate, %:		
	Not applicable		5
	<50 or not reported	0,5	1
	50-74	1	1
	>75	1,5	4
Type of data	Assessment by participants	1	4
	Objective measurement	3	7
Validity of evaluation instrument	*Internal structure:*		
	Not applicable		4
	Not reported	0	3
	Reported	1	4
	Content:		
	Not applicable		4
	Not reported	0	3
	Reported	1	4
	Relationships to other variables:		
	Not applicable		4
	Not reported	0	3
	Reported	1	4
Data analysis	*Appropriateness of analysis:*		
	Inappropriate for study design or type of data	0	2
	Appropriate for study design, type of data	1	9
	Complexity of analysis:		
	Descriptive analysis only	1	7
	Beyond descriptive analysis	2	3
Outcomes	Satisfaction, attitudes, perceptions, opinions, general facts	1	3
	Knowledge, skills	1,5	2
	Behaviors	2	1

	Patient/health care outcome	3	6
Total possible score		18	

Results

We found no articles describing optimal team composition for emergency training. All the reviewed articles describe real life treatment, not simulation. When presenting the results, we have divided our findings into two different sets of teams: First, those involved in inpatient resuscitation and second, those concerned with acutely admitted patients resuscitation. Most of the literature was related to management of acutely admitted patients with major trauma.

1. Outpatients/ Acutely admitted patients

Trauma teams

The advent of trauma teams has been shown to improve patient outcomes. (3) One of the key features of the trauma team that is believed to contribute to the improved patient outcome is the multidisciplinary nature of the team. (4-7)

The 1996 NICE guidelines from the UK recommend that trauma units should have a multispecialty trauma team available to receive patients with major trauma. They recommend not to use a tiered trauma team response. They should however have a paediatric trauma team immediately available for children under 16. For the larger major trauma centres, they recommend also having a paediatric trauma team but suggest considering a tiered trauma response for adults with either a standard multispecialty trauma team or a standard multispecialty trauma team with involvement of specialists from supporting departments and services such as transfusion, interventional radiology, and surgery. They do not describe members of this multispecialty trauma team. (Major Trauma: Service Deliver. National Institute for Clinical Excellence, www.nice.org.uk/guidance/ng40 (accessed 15 July 2021).

There is considerable variation in trauma team composition internationally, although there appears to be a consensus that a basic trauma team requires a team leader, who is usually a surgeon but can also be an emergency physician. The team should also include an anaesthetist, one or two emergency nurses and a radiology technician. (8) Some hospitals include specifically trained response nurses in their trauma teams, which improves the overall function of the team as suggested by staffing surveys. While the team leader coordinates the resuscitation and performs the initial survey, the anaesthetist manages the airway, the radiologist performs the imaging and the nurse scribes and assists with procedures. (9)

Trauma teams can be strengthened by the addition of a neurologist or neurosurgeon to perform the neurological assessment and a radiologist to conduct a focused assessment sonography (FAST) and to interpret the images. However, other members of the basic trauma team can also fill these roles. (8) Although additional team members are often present, it is important not to have an excessive number of people in the team, as it becomes more difficult to ensure that the team leader has overview and that all team members adhere to the advanced trauma life support (ATLS) protocol. (8)

In some hospitals the composition of the trauma team varies according to the reported trauma mechanisms and expected injuries. (10-12)

A survey sent to the directors of all 64 approved emergency medicine residency programs in the US with an 84% response rate (54 programs) found that 39 programs (72%) had functioning trauma teams. However, the trauma team composition varied widely in the different hospitals. Only 38% of the trauma teams included an anaesthetist and only 54% included a surgeon. On the other hand, 90% of the teams included an emergency-medicine resident. This emergency medicine resident served as trauma leader in 50% of trauma cases, sharing the role with the general surgical resident 23% of the time. (13) This survey suggests that in the US many traumas are managed without an anaesthetist or surgeon in the team.

A Danish cross-sectional questionnaire study covering all hospitals in Denmark with emergency departments examined the composition of Danish trauma teams. The study found that all hospitals had a designated trauma team that consisted of a median of nine (7-11) different personnel groups including four (2- 6) physicians and three (2-4) senior physicians. (14)

Trauma team Leader

An essential component of the trauma team is the trauma team leader responsible for leading the resuscitation. (1) Strong leadership has been shown to improve speed and quality of patient care in trauma resuscitation, therefore leadership and teamwork training should be focused on in order to optimize patient care. (15)

The role of trauma team leader is often filled by a surgeon or an emergency physician (16). A retrospective study from a trauma registry in Canada analysing 571 patients over a period of one year found no difference in patients' outcome when the team leader was a resident emergency physician or a resident surgeon. (16) The finding that the specialty of the team leader does not affect patient outcome is consistent with other studies. (17, 18)

Further studies comparing a surgical vs. non-surgical team leader found similar results including no difference in predicted survival or length of stay in the emergency department. (17-19) Having a surgeon on the trauma team has been shown to reduce resuscitation time and time to surgery but not patient mortality. (18, 20)

One study looked at using a senior nurse as the trauma team leader. Survey feedback from the nursing staff was positive regarding team communication and leadership skill. However, there was no analysis of impact on patient outcomes, and the study was single centre and small. (21)

Paediatric Trauma Teams

The American Academy of Paediatrics guidelines recommend that a paediatric trauma team should be composed of 10-12 members, including one physician as team leader, two additional physicians, one neurosurgeon, one anaesthetist, one orthopaedic surgeon, emergency nurses, one respiratory therapist, one laboratory technician and one radiology technician. (Paediatric emergencies: An excerpt from 'Guidelines for Categorization of Hospital Emergency Capabilities.' Endorsed by the American Academy of Paediatrics. Paediatrics 85:897,1990.)

However, retrospective studies analysing patients' outcome with smaller paediatric trauma teams have shown similar patient outcomes. (22, 23) This includes a study in a Canadian hospital of 146 patients where the trauma team consisted of five members including one paediatric emergency

physician, one paediatric emergency resident, one paediatric critical care resident, one respiratory therapist and one paediatric nurse. (23)

Specialised Trauma Teams -Limb amputation team

One centre has reported that they have a specific field team for limb amputations. This team consists of an attending trauma surgeon, a resident surgeon, a nurse, and a pilot. This team is able to perform amputation in the field if required. (24) Other centres report a larger limb amputation team also including the trauma surgeon and the nurse but also an anaesthetist, an orthopaedic surgeon, and a cardiologist, thereby also allowing for intubation of the trauma victim prior to limb amputation. (25) The centre with the smallest team argues that the small size is meant to minimize the number of people to fit into the helicopter. In such cases, the trauma surgeon administers the drugs to induce pain relief and amnesia to the patient. This amputation field team will therefore add support to the emergency services team already present at the scene and the trauma surgeon can take command and perform the amputation. (24)

Paediatric Transport Teams

Another study relating to emergency team composition was a retrospective study looking at transport of 25 mechanically ventilated paediatric patients. It found that the addition of a physical therapist to the transport team consisting of a physician, a nurse and a nursing technician contributed to minimizing clinical complications. However, this study was also small and had no control group. (26)

Neurological Emergencies -Acute Stroke

Several hospitals have their own 24-hour acute stroke team whose composition varies among hospitals. (27) However, this may be challenging to achieve in smaller hospitals. In one community-hospital this was resolved by developing a stroke team facilitator role to assist in the treatment of strokes. These facilitators were from several health care professions including nurses, physical therapists, respiratory therapists, and EKG technicians. They were specifically trained in the timely treatment of stroke and in charge of liaising with neurology-, radiology-, laboratory- and pharmacology-staff, thereby assisting the nurses and doctors in the acute management of stroke. With their stroke team facilitator, they were able to provide a 24 hours-acute stroke service and showed (although with small numbers) an increase in the number of patients treated with intravenous tenecteplase. (27)

Another stroke study, a retrospective study of 105 patients treated with recombinant tissue plasminogen activator for acute ischemic stroke between 2008 and 2012 in the emergency department of a comprehensive stroke centre, found benefits of adding a pharmacist to the acute stroke team. The addition of a pharmacist to the team reduced median door-to-treatment time significantly, however dosing accuracy and percentage of patients with a door-to-treatment time of less than 60 minutes was not significantly reduced. (28)

2. Inpatients

Rapid Response Team /Critical Care Outreach Team

A rapid response team deals with inpatient emergencies, which involves the clinical deterioration of hospitalized patients. These teams are often also referred to as critical care outreach teams. Our review of the literature revealed a few studies relating to the composition of such teams. Among

these was a survey of 77 hospitals in the Netherlands, which found that in 65% (55) of these hospitals the rapid response team only consisted of two members. (29)

Addition of a Pharmacist

A single centre pre/post interventional study retrospectively analysed 175 patient records post the introduction of a pharmacist to the rapid response team compared with 161 preceding the introduction. The primary objective was to observe if the addition of a pharmacist to the team reduced medication turnaround time. (30) Medication turnaround time is the time interval from prescription until drug administration. (31) It did show a reduction in both median turnaround time and in the percentage of patients where the turnaround time was less than 30 min; however, neither of these results was statistically significant. (30)

Addition of a physician assistant

The effect of adding a physician assistant to a critical care outreach team was studied in a retrospective analysis of two hospitals in New York, USA, looking at over 3099 patients. Despite finding that the addition of the physician assistant led to a significant reduction in time to transfer to the ICU, there was no difference in mortality or length of hospital stay for these patients. (32)

Cardiopulmonary resuscitation teams (inpatient)

In a survey of 77 hospitals in the Netherlands, they found that cardiopulmonary resuscitation (CPR) teams consisted of a minimum of five team members. These team members included cardiologists, anaesthetists, intensivists and physicians from the emergency department.

Cardiac resuscitation team leader

The role of team leader varied according to the hospital type. In university hospitals the role was most often performed by the resident anaesthetist. On the other hand, this task was most commonly performed by emergency department doctors in teaching hospitals and by intensive care doctors in non-teaching hospitals. The role of airway manager was always allocated to the resident anaesthetist in university hospitals; however, in both teaching and non- teaching hospitals this task was performed mainly by intensive care doctors. (29)

In a study about cardiac arrest teams covering all hospitals in Denmark involved in emergency care they found that these teams consisted of a median of six (range 5-10) different personnel groups, including three (1-6) physicians and one (0-2) senior physician. (14)

Psychiatric emergencies

A single centre report of patients admitted to the emergency department with psychiatric emergencies argues that they can be cost effectively managed by an interdisciplinary team consisting of a psychiatrist, psychiatric nurse, social worker, and clinical psychologist. (33)

Discussion

Based on published papers on clinical practices, there appears to be "several roads to Rome" regarding the optimal team composition in an emergency resuscitation. Some hospitals advocate a large team while others manage with a smaller team. The minimum team described, a rapid response team, appears to require only two members, a doctor team leader and a nurse.

Most of the literature refers to trauma teams. Here the consensus is that a basic trauma team should consist of at least a team leader, one or two emergency nurses, a radiology technician and, preferably, an anaesthetist.
Our review of also shows that a trauma team needs a team leader but that this leader may not need to be a surgeon or even a doctor. (21)

Specialized team compositions are required for paediatric patients and acute stroke patients but again there are local variations.

Regarding the overall quality of the studies we reviewed, many of these scored low on the MESRSQI score. There were no randomized control trials and most studies were of single groups. The studies were also primarily single centres with descriptive analysis only.

In our search through the literature for the optimal team composition to deal with emergencies, we have therefore discovered variations in how to treat these emergencies efficiently. What is clearly lacking is any discussion of the optimal team composition **for training in** emergency medicine. In our literature search we found no articles on this topic. This leads us to assume that the "characters" used in simulation for training in emergencies are based on real life rather than on what would be required for the optimal training scenario. While this is a sensible approach, it does not answer our key question: what is the optimal team composition of training in emergencies?

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1. Murphy M, Curtis K, McCloughen A. What is the impact of multidisciplinary team simulation training on team performance and efficiency of patient care? An integrative review. Australas Emerg Nurs J. 2016;19(1):44-53.
2. Reed DA, Cook DA, Beckman TJ, Levine RB, Kern DE, Wright SM. Association between funding and quality of published medical education research. Jama. 2007;298(9):1002-9.
3. Epstein NE. Multidisciplinary in-hospital teams improve patient outcomes: A review. Surg Neurol Int. 2014;5(Suppl 7):S295-303.
4. West JG, Trunkey DD, Lim RC. Systems of trauma care. A study of two counties. Archives of surgery. 1979;114(4):455-60.
5. West JG, Cales RH, Gazzaniga AB. Impact of regionalization. The Orange County experience. Archives of surgery. 1983;118(6):740-4.
6. Clemmer TP, Orme JF, Jr., Thomas FO, Brooks KA. Outcome of critically injured patients treated at Level I trauma centers versus full-service community hospitals. Critical care medicine. 1985;13(10):861-3.
7. Shatney CH. Initial resuscitation and assessment of patients with multisystem blunt trauma. Southern medical journal. 1988;81(4):501-6.
8. Tiel Groenestege-Kreb D, Van Maarseveen O, Leenen L. Trauma team. British journal of anaesthesia. 2014;113(2):258-65.

9. Liu SI, Curren J, Leahy NE, Sobocinski K, Zambardino D, Shikar MM, et al. Trauma Response Nurse: Bringing Critical Care Experience and Continuity to Early Trauma Care. Journal of trauma nursing : the official journal of the Society of Trauma Nurses. 2019;26(4):215-20.
10. Cherry RA, King TS, Carney DE, Bryant P, Cooney RN. Trauma team activation and the impact on mortality. The Journal of trauma. 2007;63(2):326-30.
11. Bevan C, Officer C, Crameri J, Palmer C, Babl FE. Reducing "cry wolf"--changing trauma team activation at a pediatric trauma centre. The Journal of trauma. 2009;66(3):698-702.
12. Kouzminova N, Shatney C, Palm E, McCullough M, Sherck J. The efficacy of a two-tiered trauma activation system at a level I trauma center. The Journal of trauma. 2009;67(4):829-33.
13. Slagel SA, Skiendzielewski JJ, Martyak GG, Brotman S. Emergency medicine and surgery resident roles on the trauma team: A difference of opinion. Annals of emergency medicine. 1986;15(1):28-32.
14. Lafrenz T, Lindberg SO, La Cour JL, Folkestad L, Hallas P, Brabrand M. Emergency teams in Danish emergency departments. Danish medical journal. 2012;59(6).
15. Ford K, Menchine M, Burner E, Arora S, Inaba K, Demetriades D, et al. Leadership and Teamwork in Trauma and Resuscitation. The western journal of emergency medicine. 2016;17(5):549-56.
16. Butler MB, Erdogan M, Green RS. Effect of an Emergency Medicine Resident as Team Leader on Outcomes of Trauma Team Activations. Aem Education & Training. 2018;2(2):107-14.
17. Ahmed JM, Tallon JM, Petrie DA. Trauma management outcomes associated with nonsurgeon versus surgeon trauma team leaders. Annals of emergency medicine. 2007;50(1):7-12, e1.
18. Cummings GE, Mayes DC. A comparative study of designated Trauma Team Leaders on trauma patient survival and emergency department length-of-stay. Cjem. 2007;9(2):105-10.
19. Hartmann J, Gabram S, Jacobs L, Libby M. A model for an integrated emergency medicine/trauma service. Academic emergency medicine : official journal of the Society for Academic Emergency Medicine. 1996;3(12):1136-9.
20. Khetarpal S, Steinbrunn BS, McGonigal MD, Stafford R, Ney AL, Kalb DC, et al. Trauma faculty and trauma team activation: impact on trauma system function and patient outcome. The Journal of trauma. 1999;47(3):576-81.
21. Clements A, Curtis K, Horvat L, Shaban RZ. The effect of a nurse team leader on communication and leadership in major trauma resuscitations. International emergency nursing. 2015;23(1):3-7.
22. Haftel AJ. Pediatric Trauma center- an atypical model a temporal and outcome analysis Pediatric Emergency Care. 1990;6(3):226.
23. Singh R, Kissoon N, Singh N, Girotti M, Lane P. Is a full team required for emergency management of pediatric trauma? Journal of Trauma. 1992;33(2):213-8.
24. Sharp CF, Mangram AJ, Lorenzo M, Dunn EL. A major metropolitan "field amputation" team: A call to arms and legs. Journal of Trauma - Injury, Infection and Critical Care. 2009;67(6):1158-61.
25. Ebraheim NA, Elgafy H. Bilateral below-knee amputation surgery at the scene: case report. The Journal of trauma. 2000;49(4):758-9.
26. Valerio N, Remondini R, Giovanetti EA, Do Prado C, Troster EJ. Transport of pediatric patients with the assistance of a physical therapy team. American Journal of Respiratory and Critical Care Medicine Conference: American Thoracic Society International Conference, ATS. 2012;185(MeetingAbstracts).
27. Cysyk B, Goodison K, Simpkins S, Thompson P. Stroke Team Facilitator role in a community hospital. Stroke; a journal of cerebral circulation. 2009;40 (4):e285.

28. Gosser RA, Arndt RF, Schaafsma K, Dang CH. Pharmacist Impact on Ischemic Stroke Care in the Emergency Department. Journal of Emergency Medicine. 2016;50(1):187-93.
29. Schluep M, van Limpt GJC, Stolker RJ, Hoeks SE, Endeman H. Cardiopulmonary resuscitation practices in the Netherlands: results from a nationwide survey. BMC health services research. 2019;19(1):333.
30. Feih J, Katz M, Schaafsma K. Establishing pharmacist presence on a rapid response team: A pilot study. Critical care medicine. 2013;1):A125.
31. Wietholter J, Sitterson S, Allison S. Effects of computerized prescriber order entry on pharmacy order-processing time. Am J Health Syst Pharm. 2009;66(15):1394-8.
32. Gershengorn HB, Xu Y, Chan CW, Armony M, Gong MN. The Impact of Adding a Physician Assistant to a Critical Care Outreach Team. PloS one. 2016;11(12):e0167959.
33. Slaby AE, Goldberg RJ, Wallace SR. Interdisciplinary team approach to emergency psychiatric care. Psychosomatics. 1983;24(7):627-37.

Annex 1-GUIDELINE FOR DATA COLLECTION

◯ Single Choice ☐ Multiple Choice

Confidential

SAFETY
Page 1

Emergency Offer

Researcher	◯ El Del Rio ◯ M Cazalis ◯ I Belda ◯ C Carramiñana ◯ B Tena ◯ R Berge ◯ S Martin ◯ C Ibañez ◯ L Gomez ◯ J Perdomo ◯ M lopez ◯ T Cuñat ◯ M Magaldi ◯ A Calvo ◯ C Ferrando
Name of the emergency course	
Name of the institution offering the course	
Offered by	☐ Public University ☐ Private University ☐ Private Hospital ☐ Public Hospital ☐ Emergency Service ☐ Scientific Society ☐ Private simulation centre/company ☐ Public simulation centre ☐ Other
If other, specify	
Is the course promoted online?	◯ Yes ◯ No
More than one option is possible	☐ Website ☐ Twitter ☐ Facebook ☐ Instagram ☐ Other
If other, specify	
Is the syllabi available online?	◯ Yes ◯ No
are the aims and objectives published?	◯ Yes ◯ No

Specific example for Barcelona Team

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How frequent is this course? A new course edition starts every	◯ Days ◯ Weeks ◯ Months ◯ Years ◯ On demand ◯ Information unavailable
Days	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7
Weeks	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ 11 ◯ 12
Months	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ 11 ◯ 12
Years	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ more than 5 years
Course duration. Number of educational hours or ECTS (European Credit Transfer and Accumulation System)	◯ Hours ◯ ECTS ◯ Information Unavailable
Number of hours	_____
ECTS	_____
course delivery	◯ Face to face ◯ Online ◯ Blended (both face to face and online) ◯ Information unavailable

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This course is aimed at (Target group). More than one option is possible	☐ Undergraduate nurses ☐ Undergraduate physicians ☐ Medical resident ☐ Midwife resident ☐ Nurse ☐ Midwife ☐ Specialist physician ☐ Paramedic ☐ Other ☐ Information unavailable
If other, specify	_____
Please specify if personal requirement	_____
Is there any admission requirement, different from the target group?	◯ Yes ◯ No ◯ Information unavailable
Type of requirement (more than one option is possible)	☐ Previous clinical experience ☐ Previous courses ☐ Personal requirements (gender, age, nationality) ☐ Other
Specify if other requirement	_____
Is there a maximum number of participants? (capacity limitation)	◯ yes ◯ No ◯ Information unavailable
What is the cost of the course?	◯ Free ◯ 100 EUR or less ◯ Between 100 EUR and 499 EUR ◯ Between 500 EUR and 999 EUR ◯ Between 1000 EUR and 4999 EUR ◯ Between 5000 EUR and 9999 EUR ◯ Between 10000 EUR and 19999 EUR ◯ 20000 EUR or more ◯ Information unavailable
Content of this course. Is this Course composed of:	☐ theory content ☐ practical content ☐ Information unavailable
If, theory content, do we know the % of theory content?	◯ Yes ◯ No
If, practical content, do we know the % of practical content?	◯ Yes ◯ No
% of theory	_____
% of practical	_____

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Is this course	◯ Mandatory ◯ Optional ◯ Information unavailable
If mandatory	☐ by institution ☐ by law ☐ by national regulation
Is the main emergency topic of this course clear?	◯ Yes ◯ No
What is the main emergency topic?	_____
Please select the emergency field of the course? More than one option is possible.	☐ Anesthesiology ☐ Cardiology ☐ Intensive Care Medicine ☐ Emergency Medicine ☐ Paediatrics ☐ Resuscitation ☐ Prehospital Medicine ☐ Obstetrics ☐ Emergency Management Resources ☐ Other
If other field, please specify	_____
Is this course accedited?	◯ Yes ◯ No ◯ Information unavailable
Accredited by?	_____
Does this course have a final certification?	◯ Yes National certification ◯ Yes European certification ◯ No certification ◯ Other ◯ Information unavailable
Other certification, specify	_____
Does this course have a final evaluation?	◯ Yes ◯ No ◯ Information unavailable
Does this course include simulation?	◯ Yes ◯ No ◯ Information Unavailable
If simulation included, Would it be possible to know the % of the course which involves simulation?	◯ Yes ◯ No
% of simulation	_____

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If simulation is used, which goals are meant to be achieved by the use of simulation?	◯ Acquisition of technical skills ◯ Acquisition of Non-Technical skills ◯ Both ◯ Information unavailable
If technical skills, please specify the goal (more than one option is possible)	☐ Diagnosis and treatment ☐ Related to CPR (Cardiopulmonary resuscitation) ☐ Related to trauma patient management ☐ Related to airway management ☐ Related to lines and catheter placement ☐ Related to chest tube insertion ☐ Related to emergency ultrasound diagnosis ☐ Related to vaginal/caesarean delivery ☐ Related to mechanical support devices ☐ Related to imaging interpretation ☐ Related to laboratory results interpretation ☐ Related to emergency advanced monitoring ☐ Clinical reasoning ☐ Other
If technical skills, please specify the goal (more than one option is possible)	☐ Diagnosis and treatment ☐ Related to CPR (Cardiopulmonary resuscitation) ☐ Related to trauma patient management ☐ Related to airway management ☐ Related to lines and catheter placement ☐ Related to chest tube insertion ☐ Related to emergency ultrasound diagnosis ☐ Related to vaginal/caesarean delivery ☐ Related to mechanical support devices ☐ Related to imaging interpretation ☐ Related to laboratory results interpretation ☐ Related to emergency advanced monitoring ☐ Clinical reasoning ☐ Other
If other, specify	_____
If other, specify	_____
If non-technical skills (NTS), please specify the goal (more than one option is possible)	☐ Related to leadership-followership ☐ Related to teamwork ☐ Related to situation awareness ☐ Related to decision making ☐ Stress management ☐ Related to team communication ☐ Related to team-patient communication ☐ Related to team-relatives communication ☐ Team building ☐ Other

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If non-technical skills (NTS), please specify the goal (more than one option is possible)	☐ Related to leadership-followership ☐ Related to teamwork ☐ Related to situation awareness ☐ Related to decision making ☐ Stress management ☐ Related to team communication ☐ Related to team-patient communication ☐ Related to team-relatives communication ☐ Team building ☐ Other
If other NTS, specify	_____
If other NTS, specify	_____
If non-technical skills (NTS). Is there reference to any of the recognised NTS frameworks? (more than one option is possible)	☐ No ☐ Crisis Resource Management (CRM) ☐ NOTECHS (Non-Technical Skills by Flin Et al) ☐ ANTS (Anaesthetic's Non-technical Skills) ☐ ANTS-AP (Anaesthetic's Non-technical Skills for Anaesthetic Practitioners) ☐ NOTSS (Non-technical skills for Surgeons) ☐ TeamSTEPPS (Teams Strategies and Tools to Enhance Performance and Patient Safety) ☐ Other
If non-technical skills (NTS). Is there reference to any of the recognised NTS frameworks? (more than one option is possible)	☐ No ☐ Crisis Resource Management (CRM) ☐ NOTECHS (Non-Technical Skills by Flin Et al) ☐ ANTS (Anaesthetic's Non-technical Skills) ☐ ANTS-AP (Anaesthetic's Non-technical Skills for Anaesthetic Practitioners) ☐ NOTSS (Non-technical skills for Surgeons) ☐ TeamSTEPPS (Teams Strategies and Tools to Enhance Performance and Patient Safety) ☐ Other
If other recognised NTS, specify	_____
If other recognised NTS, specify	_____
Which simulation devices were used in this course? (more than one option is possible)	☐ Phantom ☐ Manikin ☐ Simulated patient ☐ Virtual patient ☐ Hybrid models ☐ Online simulator ☐ Information unavailable ☐ Other
If Other, please specify	_____

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If simulation is not used, which goals are meant to be achieved?	◯ Acquisition of technical skills ◯ Acquisition non-technical skills ◯ Both ◯ Information unavailable
If technical skills, please specify the goal (more than one option is possible).	☐ Diagnosis and treatment ☐ Related to CPR (Cardiopulmonary resuscitation) ☐ Related to trauma patient management ☐ Related to airway management ☐ Related to lines and catheter placement ☐ Related to chest tube insertion ☐ Related to emergency ultrasound diagnosis ☐ Related to vaginal/caesarean delivery ☐ Related to mechanical support devices ☐ Related to imaging interpretation ☐ Related to laboratory results interpretation ☐ Related to emergency advanced monitoring ☐ Clinical reasoning ☐ Other
If technical skills, please specify the goal (more than one option is possible).	☐ Diagnosis and treatment ☐ Related to CPR (Cardiopulmonary resuscitation) ☐ Related to trauma patient management ☐ Related to airway management ☐ Related to lines and catheter placement ☐ Related to chest tube insertion ☐ Related to emergency ultrasound diagnosis ☐ Related to vaginal/caesarean delivery ☐ Related to mechanical support devices ☐ Related to imaging interpretation ☐ Related to laboratory results interpretation ☐ Related to emergency advanced monitoring ☐ Clinical reasoning ☐ Other
If other technical skill, specify	_____
If other technical skill, specify	_____
If non-technical skills, please specify the goal (more than one option is possible)	☐ Related to leadership-Followership ☐ Related to teamwork ☐ Related to situation awareness ☐ Related to decision making ☐ Stress management ☐ Related to team communication ☐ Related to team-patient communication ☐ Related to team-relatives communication ☐ Team building ☐ Other

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If non-technical skills, please specify the goal (more than one option is possible)	☐ Related to leadership-Followership ☐ Related to teamwork ☐ Related to situation awareness ☐ Related to decision making ☐ Stress management ☐ Related to team communication ☐ Related to team-patient communication ☐ Related to team-relatives communication ☐ Team building ☐ Other
If other NTS, specify	_____
If other NTS, specify	_____
If non-technical skills (NTS). Is there reference to any of the recognised NTS frameworks? (more than one option is possible)	☐ No ☐ Crisis Resource Management (CRM) ☐ NOTECHS (Non-Technical Skills by Flin Et al) ☐ ANTS (Anaesthetic's Non-technical Skills) ☐ ANTS-AP (Anaesthetic's Non-technical Skills for Anaesthetic Practitioners) ☐ NOTSS (Non-technical skills for Surgeons) ☐ TeamSTEPPS (Teams Strategies and Tools to Enhanc Performance and Patient Safety) ☐ Other
If non-technical skills (NTS). Is there reference to any of the recognised NTS frameworks? (more than one option is possible)	☐ No ☐ Crisis Resource Management (CRM) ☐ NOTECHS (Non-Technical Skills by Flin Et al) ☐ ANTS (Anaesthetic's Non-technical Skills) ☐ ANTS-AP (Anaesthetic's Non-technical Skills for Anaesthetic Practitioners) ☐ NOTSS (Non-technical skills for Surgeons) ☐ TeamSTEPPS (Teams Strategies and Tools to Enhanc Performance and Patient Safety) ☐ Other
If other recognised NTS, specify	_____
If other recognised NTS, specify	_____
Has the pandemic had an impact on this course?	◯ Yes ◯ No ◯ Information unavailable
If yes, what has been affected the most? (more than one option is possible)	☐ Availability of trainers ☐ Reduced trainees demand ☐ Economical resources ☐ Ways of delivering the course ☐ Other ☐ Information Unavailable
If other, specify	_____

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If yes, how has the course been coping with this impact? (more than one option is possible)	☐ By reducing the frequency of the course ☐ By reducing the number of admitted students ☐ By increasing the use of virtual and online resources ☐ The course is no longer available due to the pandemic ☐ Other ☐ Information Unavailable
If other, specify	_____