

The Role of General Practitioners in Trauma Care in Switzerland: Variation by Injury Type, Region, Patient Profile, and Over Time



Quelle: SUVA

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Objectives

General practitioners (GPs) play an essential role in the Swiss health care system as the main providers of ambulatory physician care⁽¹⁾. Our study analyzes to what extent and for what types of injury GPs act as initial point of care and to what extent they act as sole care providers or refer patients to other health care providers. We examined differences depending on injury type, patient profile, region, and developments over time.

Methods

Using a claims dataset from the largest Swiss accident insurer with N=2.2 million injury cases between 2008 and 2014, we constructed individual treatment sequences to determine when and from which providers patients received care. We estimated probabilities for the different types of initial care providers and for the role GPs play in the treatment sequence. Estimates were adjusted for injury type and patient characteristics using multinomial regression models.

Results

GPs provided initial care in 54% of accidents (Figure 1, left) and were the sole care providers in 43% of the cases (Figure 1, right). In addition, they provided follow-up care for 15% of the cases. Overall, GPs had some part in 71% of all accident cases.

There is, however, considerable variation in the role of GPs depending on patient profile and region. One clear pattern is that the more rural a region the higher the probability that GPs are involved. In addition, we observed that younger patients, non-Swiss citizens, and males all have a lower probability of receiving initial care from a GP (Figure 2, first panel). As a result, they also showed a lower probability of having a GP as their sole care provider.

For the period of 2008 to 2014, we observed a decrease in the probability of GPs providing initial care from 60% to 54% (Figure 3, top panel). At the same time, there was an increase from 32% to 38% for cases where a hospital emergency department (ED) became the initial point of care (in- and outpatient ED, Figure 3, bottom two panels). These complementary trends hold even when adjusting for changing patient characteristics and injury types.

Conclusions

GPs play a key role in Swiss trauma care, but there is considerable variation depending on the region, patient profile, and injury type.

Our data also confirm the claim made in the literature^(2,3), that trauma patients are treated increasingly in hospital emergency departments – at the cost of GPs who provide less trauma care. The general decline from 2008 to 2014 in GP involvement in trauma care is an indication that the role of GPs in the Swiss healthcare system is changing, which may have implications for their continuing education and training as well as for healthcare costs.

Future research should identify the relative impact of potential causes such as changes in patient behavior and in GPs' skills, preparedness, and willingness to treat trauma patients. Also, structural factors such as GPs' opening-hours and out-of-hours availability as well as the increased use of special diagnostic tools (e.g., CTs) that are not at GPs' disposal might be drivers of the observed changes.

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3. Knöfler, F., Knöfler, C., Chouk, C., Zoller, M., Stern, G., Rosenauer, T., & Huber, J. A. (2015). The provision of out-of-hours care and associated costs in an urban area of Switzerland: a cost-recovery study. *BMC Fam Pract*, 16, 35.

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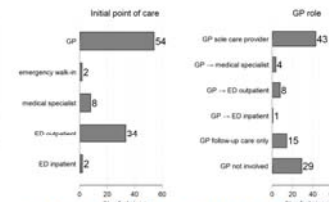


Figure 1: Initial point of care (left) and GP role in trauma care (right) overall. N=2.2 million accident insurance claims 2008-2014. ED: emergency department; medical specialist e.g. orthopedic or trauma specialist.

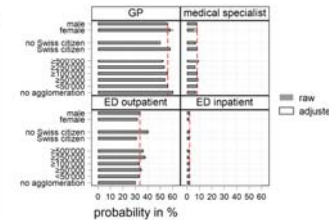


Figure 2: Initial point of care by patient profile and region. Raw and adjusted probabilities (in %). The shaded red line indicates the mean. Adjusted probabilities are based on a multinomial model adjusting for injury type and location, time of the accident, patient's gender, citizenship, age, and place of residence (agglomeration size). ED: emergency department; medical specialist e.g. orthopedic or trauma specialist.

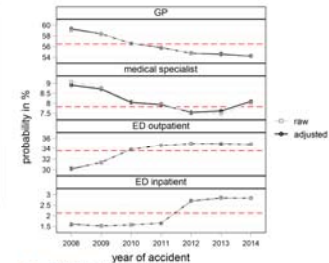


Figure 3: Initial point of care over time. Raw and adjusted probabilities (in %). The shaded red line indicates the mean. Adjusted probabilities are based on a multinomial model adjusting for injury type and location, time of the accident, patient's gender, citizenship, age, and place of residence (agglomeration size). ED: emergency department; medical specialist e.g. orthopedic or trauma specialist.

Objectives: Role of general practitioners (GPs) in Switzerland

- **General practitioners (GPs)** include physicians in private practice certified as general practitioners, specialists in general internal medicine, pediatricians and physicians without a specialty qualification.
- GPs play an **essential role in the Swiss health care system** as the main providers of ambulatory physician care (Djalali et al. 2015).
- This also holds for trauma care. 15% of all GP consultations are related to accidents (Tschudi & Rosemann, 2010).
- **GPs provide emergency services at lower costs** than emergency departments (EDs) (Chmiel et al., 2011; Eichler et al., 2014; Eichler et al., 2010; Fritschi & Ballmer, 2014; Hugentobler, 2006).
- **Research questions:**
 - To what extent and for what types of injury do **GPs act as initial point of care?**
 - To what extent do they act **as sole care provider** or refer patients to other health care providers?
 - Are there differences depending on injury type, patient profile, region, and developments over time?

Context: Challenges in primary care provision

- There is **criticism** regarding the **low priority of primary care in medical education and training**, on the **relatively low earnings for GPs** and on their **undervalued status** in general (Djalali et al. 2015; Tschudi & Rosemann 2010).
- **Low and decreasing number of GPs in rural areas**, a problem that will accentuate in the near future due to a lack of young GPs that could replace an ageing GP population (Mercay 2015).
- **GPs perform less and less trauma-related care** – with large regional variations, however (Cohidon, Cornuz, & Senn, 2015).
- **GPs are no longer required to cover accident surgery in their medical education.**
- **Patients increasingly search assistance directly at emergency departments (EDs)** – even if a GP could provide suitable care (Chmiel et al. 2011; Eichler et al. 2010, Eichler et al. 2013; Flaig et al. 2002; Meer et al. 2003)

Design and data

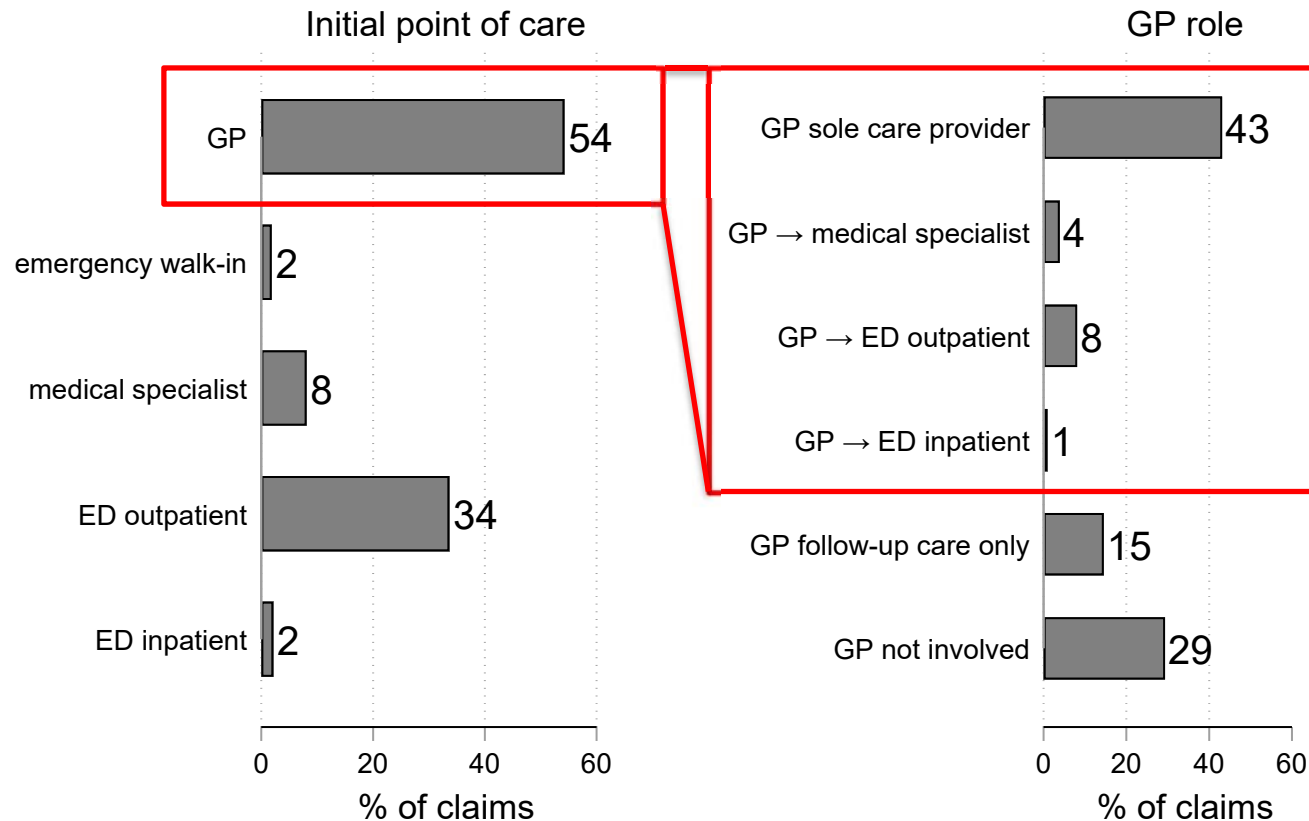
- Analysis of a claims dataset with **N = 2,195,559 injury cases between 2008 and 2014** from the Swiss National Accident Insurance Fund (SUVA)
- **Construction of individual treatment sequences** to determine when and from which providers patients received care.
- **Main outcomes:**
 - initial care provider
 - role of GPs in the treatment
- **Estimation of probabilities** for the different types of initial care providers and for the role of GPs - adjusted for injury type and patient characteristics using multinomial regression.

- Data source: **accident report form**

The screenshot displays a web-based form for reporting an accident. The form is organized into several sections:

- Arbeitgeber & Police**: A text input field for the employer and police information.
- Versicherte Person**: A text input field for the insured person's name.
- Unfallmeldung**: A text input field for the accident report details.
- Arbeitsunfähigkeit**: A text input field for work incapacity.
- Verletzung**: A section for injury details, including:
 - Hauptverletzung**: A dropdown menu currently showing "Hauptverletzung".
 - Weitere Verletzung 1** and **Weitere Verletzung 2**: Additional dropdown menus for secondary injuries.
- Hauptverletzung**: A detailed section for the main injury, including:
 - Verletzter Körperteil ***: A dropdown menu for the injured body part.
 - Verletzungsseite ***: A dropdown menu for the side of the injury.
 - Verletzungsart ***: A dropdown menu for the type of injury.
 - Zurück** and **Weiter**: Navigation buttons.
- Behandlung**: A text input field for treatment details.
- Sonder**: A text input field for special notes.

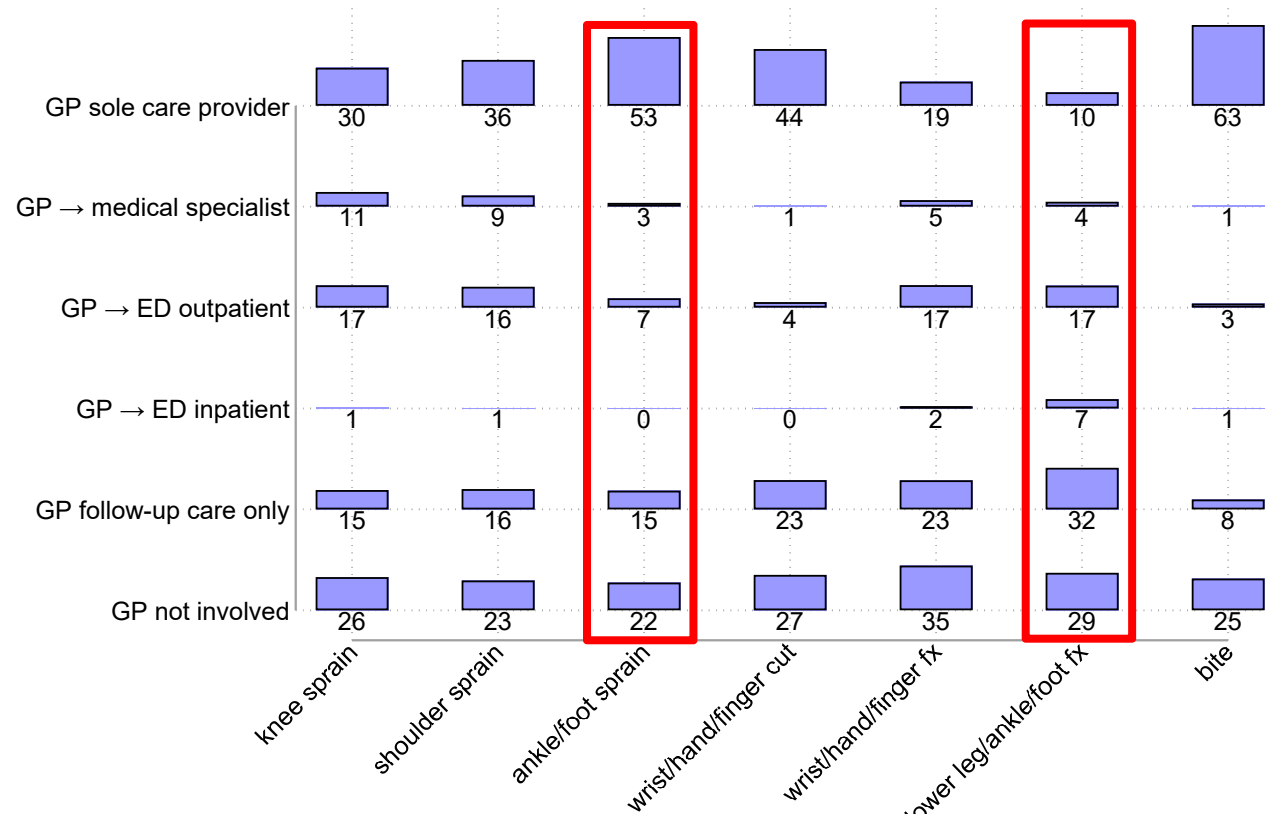
Results: Initial point of care (left) and GP role in trauma care (right) overall



- GPs provided initial care in 54% of accidents (left) and were sole care provider in 43% (right).
- Overall, GPs had some part in 71% of all accident cases.

N=2.2 million accident insurance claims 2008-2014. ED: emergency department; medical specialist: e.g. orthopedic or trauma specialist.

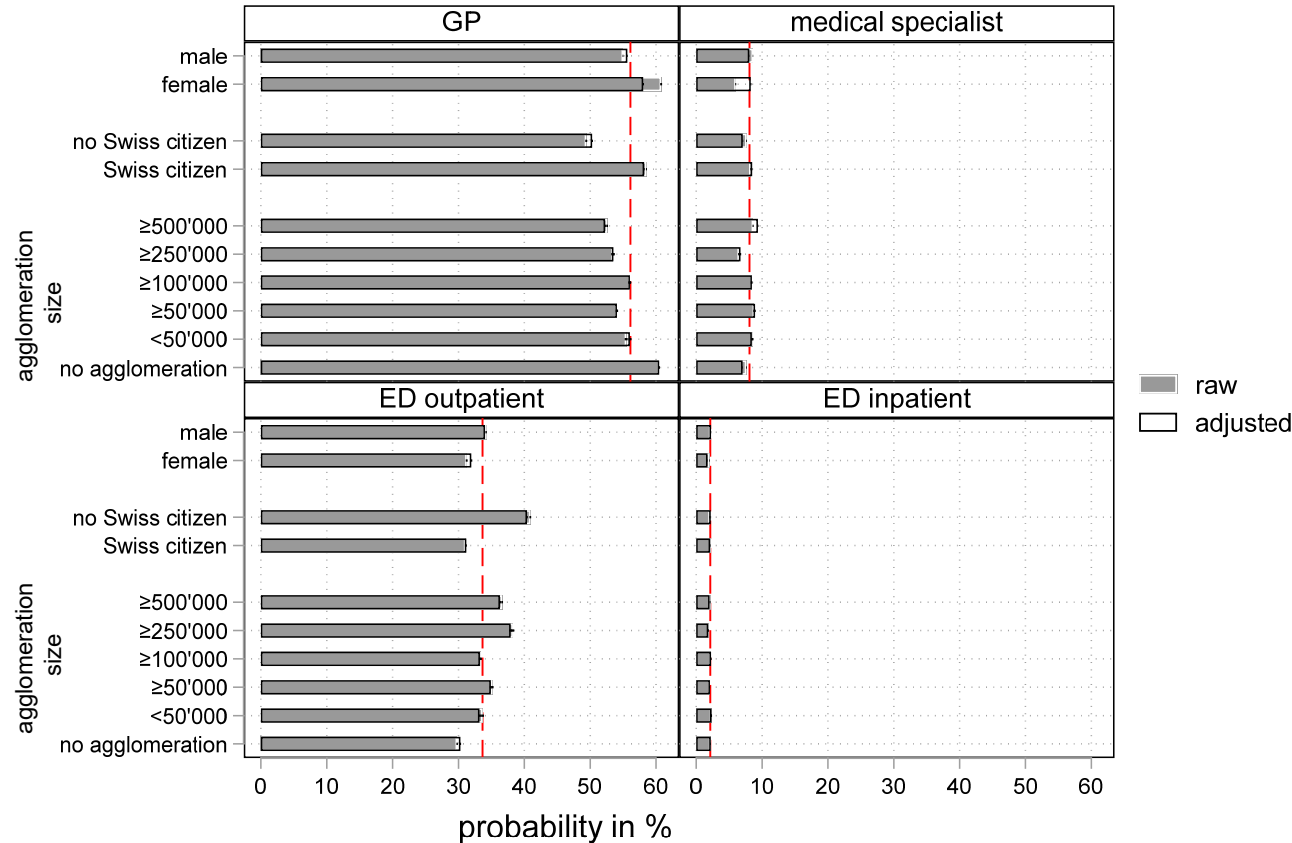
GP role by selected injuries



Reading example first column: In 30% of knee sprains, GPs act as sole care provider, in 12% they act as initial care provider and the patient, later on, sees a medical specialist, in 18% the patient after seeing a GP subsequently receives care at an emergency department as outpatient... in 24% of the cases, the GP is not involved.

Initial point of care by patient profile and region.

Raw and adjusted probabilities (in %)

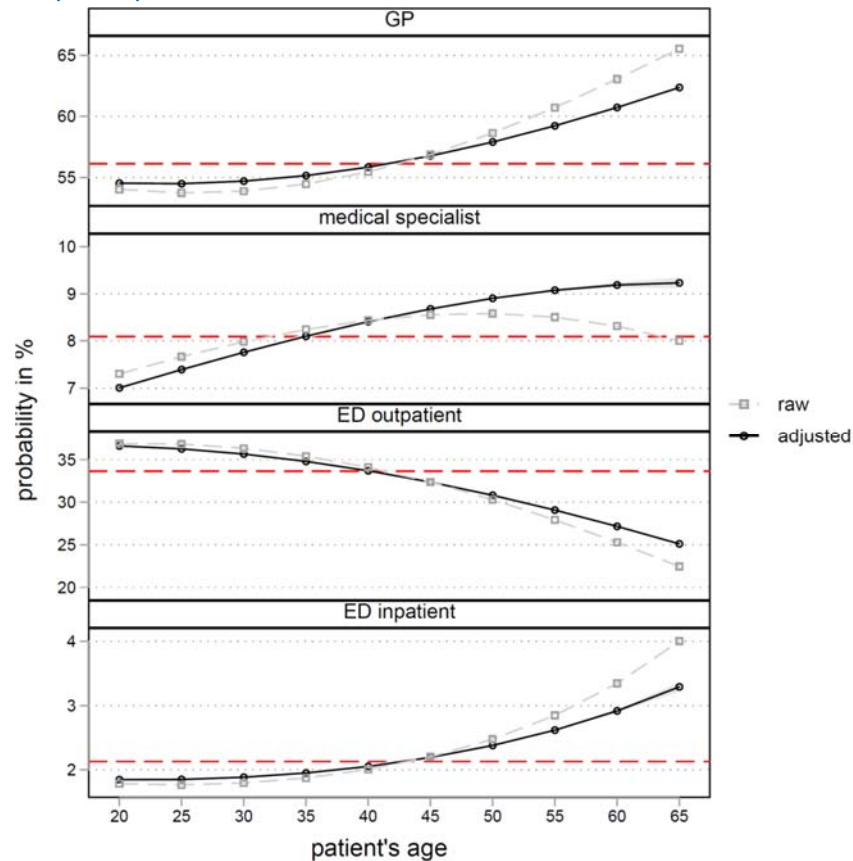


- higher probability that GPs act as initial care provider for
 - females vs. males
 - Swiss vs. non-Swiss citizens
 - more rural vs more urban regions
 - elderly vs. younger patients (next slide)

The dashed red line indicates the mean. Adjusted probabilities are based on a multinomial model adjusting for injury type and location, time of the accident, patient's gender, citizenship, age, and place of residence (agglomeration size). ED: emergency department; medical specialist: e.g., orthopedic or trauma specialist.

Initial point of care by patient age.

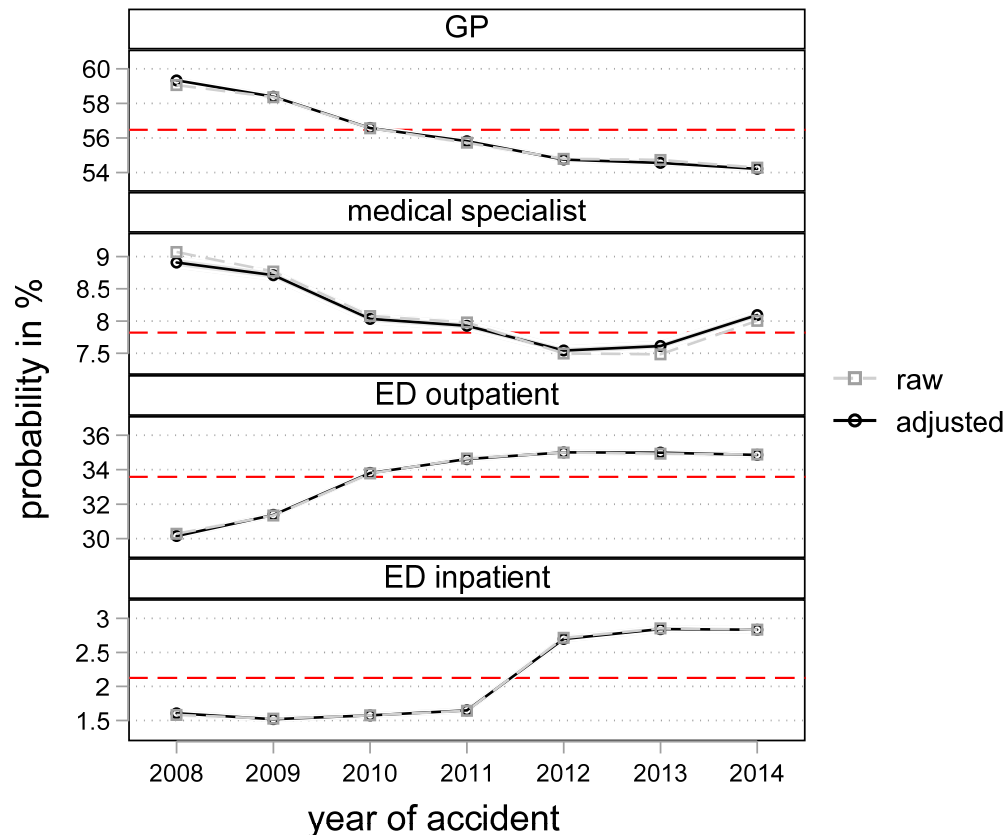
Raw and adjusted probabilities (in %)



The dashed red line indicates the mean. Adjusted probabilities are based on a multinomial model adjusting for injury type and location, time of the accident, patient's gender, citizenship, age, and place of residence (agglomeration size). ED: emergency department; medical specialist: e.g., orthopedic or trauma specialist.

Initial point of care from 2008 to 2014.

Raw and adjusted probabilities (in %)



- From 2008 to 2014, **decrease in the probability of GPs providing initial care from 60% to 54%** (top panel).
- At the same time, **increase from 32% to 38%** for cases where a **hospital emergency department (ED) became the initial point of care** (in- and outpatient ED, bottom two panels).
- These complementary trends hold even when adjusting for changing patient characteristics and injury types.

The dashed red line indicates the mean. Adjusted probabilities are based on a multinomial model adjusting for injury type and location, time of the accident, patient's gender, citizenship, age, and place of residence (agglomeration size). ED: emergency department; medical specialist: e.g., orthopedic or trauma specialist.

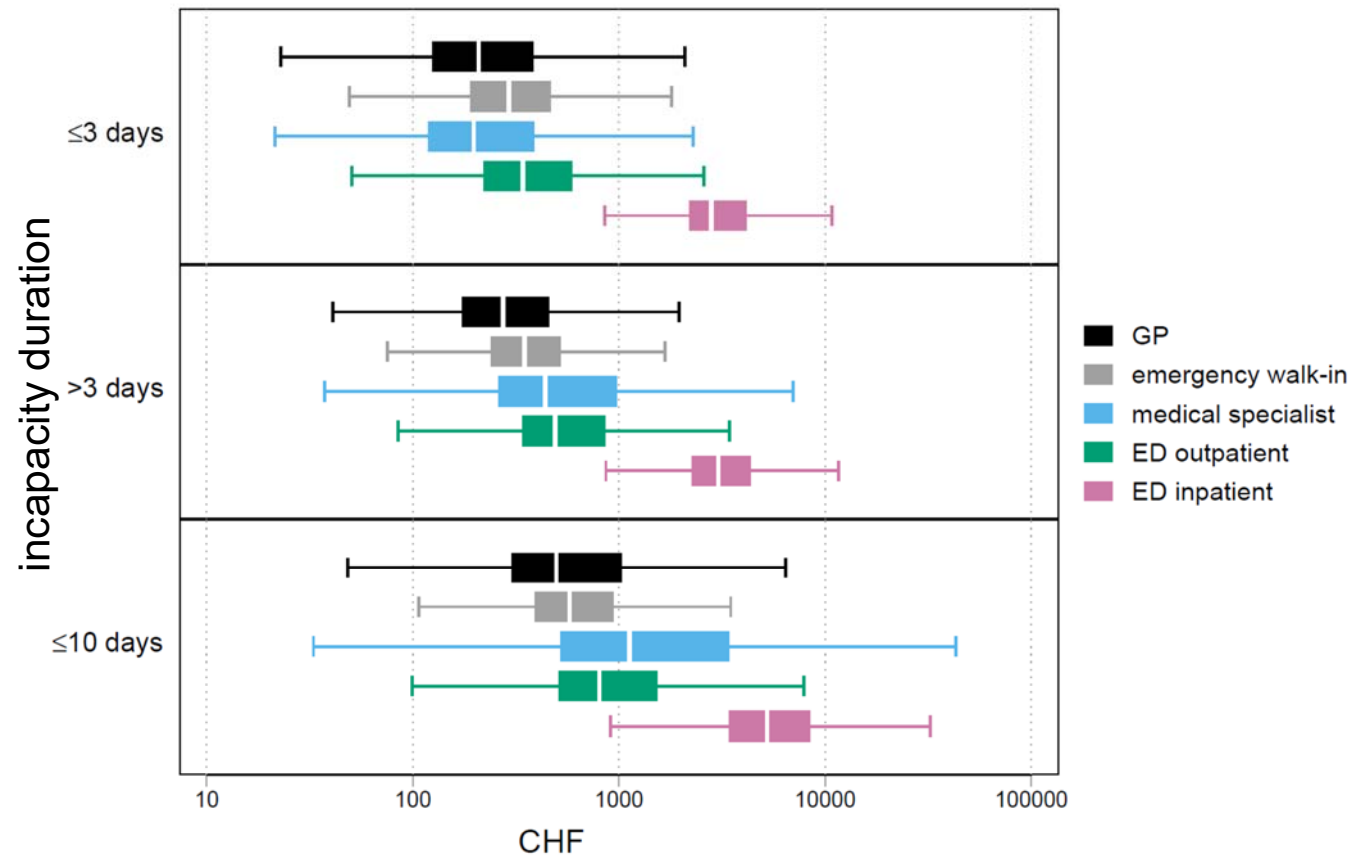
Conclusions

- **GPs play a key role in Swiss trauma care:** initial point of care in 54% of accidents, sole care provider in 43%
- Considerable **variation depending on the region, patient profile, and injury type.**
- From 2008 to 2014, trauma **patients are treated increasingly in hospital emergency departments – at the cost of GPs** who provide less trauma care.
 - role of GPs in the Swiss healthcare system is changing, which may have implications for their continuing education and training as well as for healthcare costs.
- **Limitations:** injury details based on self-administered accident report form, limited information on patient characteristics, results not straightforward generalizable to general population
- Future research should identify the relative impact of potential causes for the observed trends:
 - changes in patient behavior,
 - in GPs' skills, preparedness, and willingness to treat trauma patients
 - structural factors such as GPs' opening-hours and out-of-hours availability
 - increased use of special diagnostic tools (e.g., CTs) that are not at GPs' disposal.

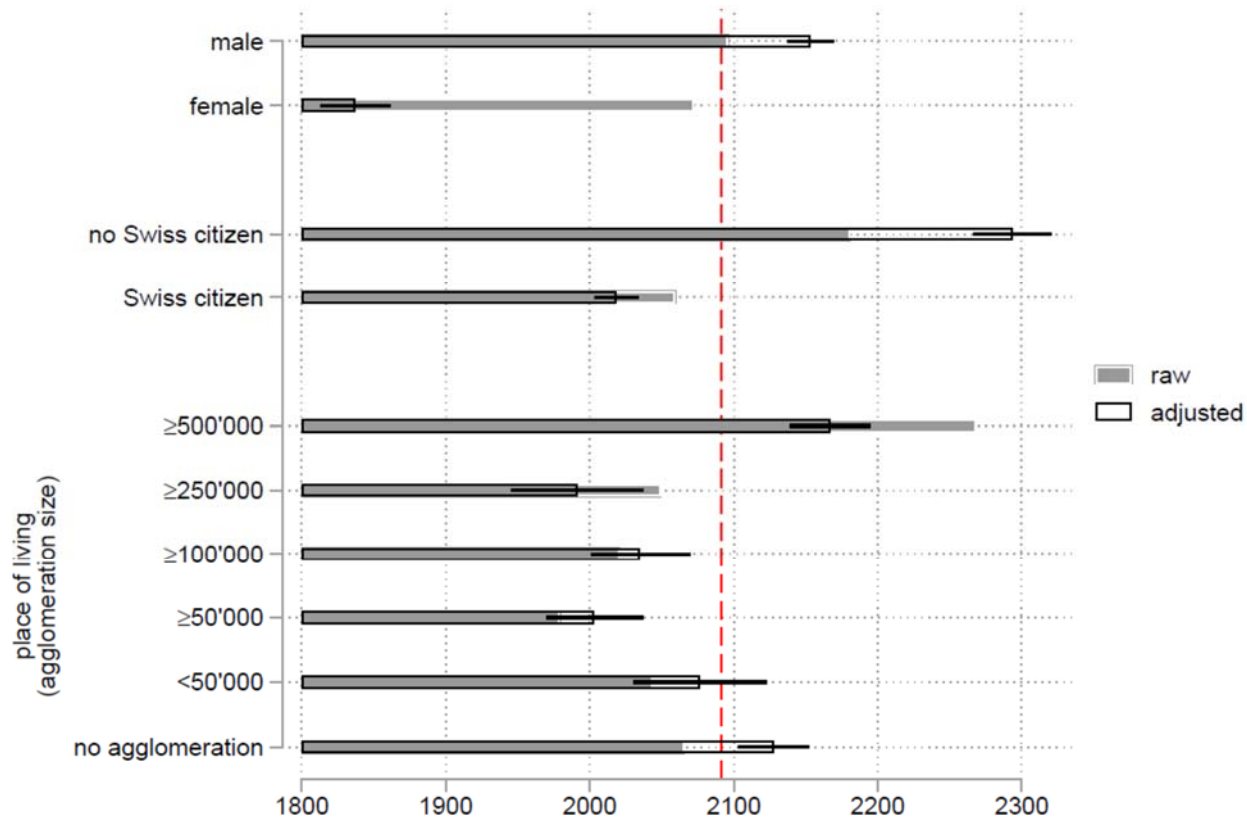
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What about the costs and cost drivers? Some first analyses...

Direct medical costs (in CHF) by incapacity duration and initial point of care unadjusted, log scale



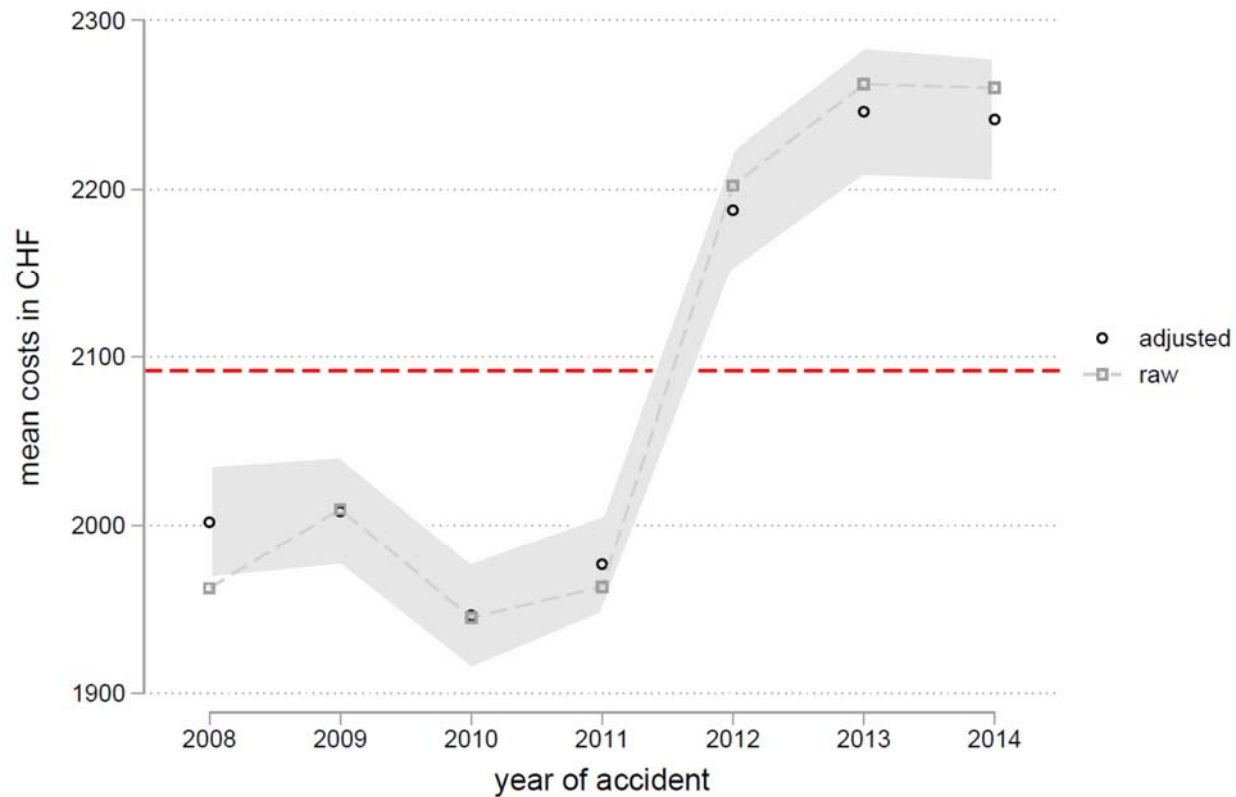
Raw and adjusted means of direct medical costs by patient profile and region



Based on multivariate regression model, adjusting for injury type and location, time of accident, patient's gender, citizenship, age, and place of living (agglomeration size).

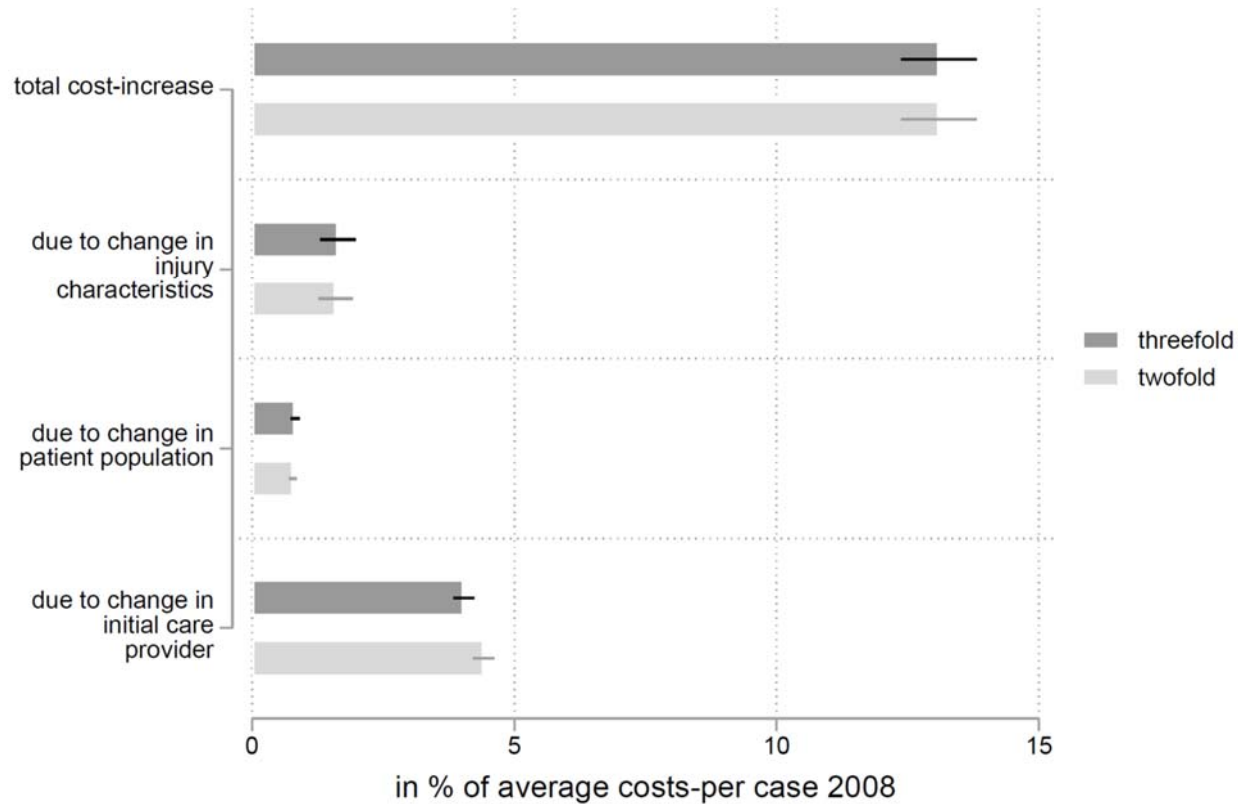
Raw and adjusted means of direct medical costs from 2008 to 2014

Costs-per-case increase of 15%: from 1'962 CHF to 2'260 CHF



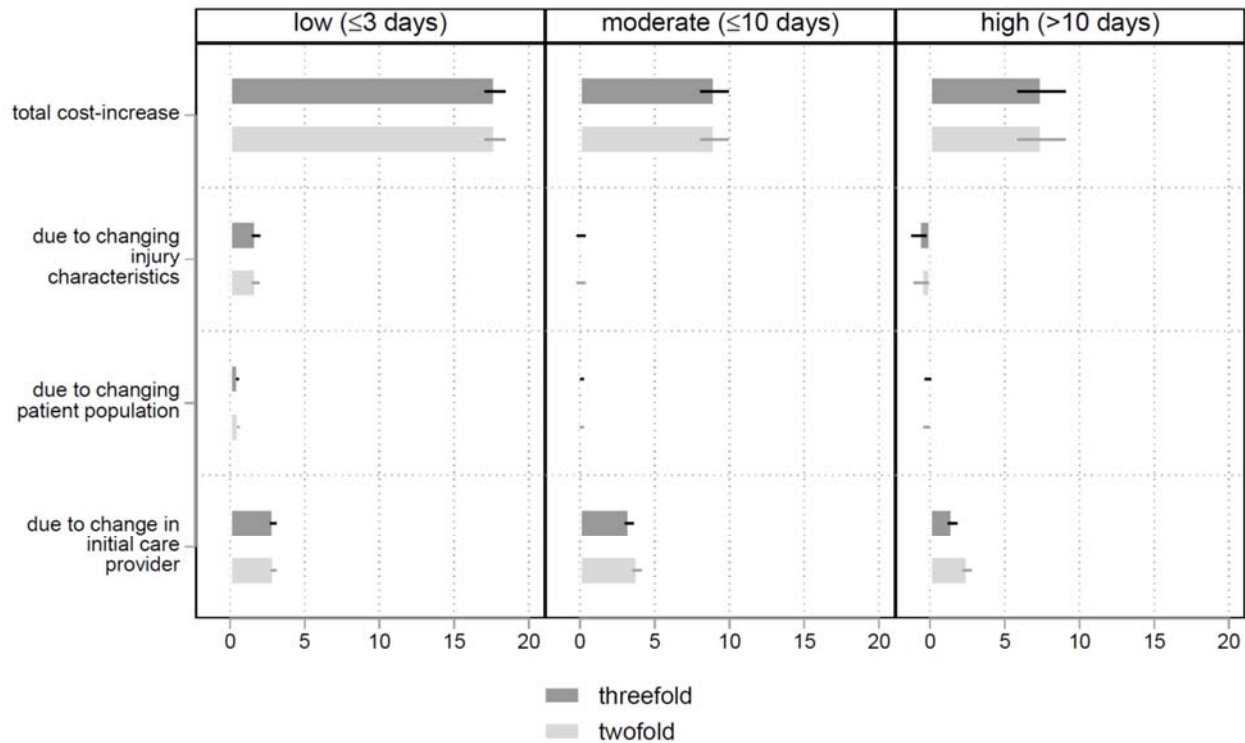
Based on multivariate regression model, adjusting for injury type and location, time of accident, patient's gender, citizenship, age, and place of living (agglomeration size).

Preliminary results: Decomposition of cost increase 2008 vs. 2014



Based on Blinder-Oaxaca decomposition of log costs taking into account: injury type and location, time of accident, patient's gender, citizenship, age, and place of living (agglomeration size)

Preliminary results: Decomposition of cost increase 2008 vs. 2014 By injury severity



in % of average costs-per-case 2008

Based on Blinder-Oaxaca decomposition taking the following into account: injury type and location, time of accident, patient's gender, citizenship, age, and place of living (agglomeration size).