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

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Objectives

General practitioners (GPs) play an essential role in the Swiss healthcare system as they are the main providers of ambulatory care services. Our study analyzes to what extent and for what types of injuries GPs act as an 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 database from the largest Swiss accident insurer with 1.2 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 the role GPs play in the treatment encounter. Estimates were stratified by patient characteristics using multivariate regression models.

Results

GPs provided initial in-hospital care in 5% of accidents (Figure 1, left) and were the sole care providers in 25% of the cases (Figure 1, right). In addition, GP provided follow-up care for 11% of the cases. Overall, GPs had some part in 77% of all accident cases.

There is, however, considerable variation in the role of GPs depending on patient profile and region. Younger patients and those from rural regions are more likely to receive initial care from a GP (Figure 1, right 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 45% (Figure 1, top panel). At the same time, there was an increase from 25% to 30% for cases where a hospital was the first care provider (Figure 1, bottom panel).

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 claims made in the literature: that trauma patients frequently visit the emergency room and the role of GPs who provide less trauma care. This trend declines from 2008 to 2014 in GP treatment in trauma care as an indication that the role of 22% in the Swiss healthcare system is changing, which may have implications for their continuing education and training as well as healthcare costs.

Future research should identify the relative impact of potential causes such as uninsured patients, reimbursements, and socio-economic differences. The role of GPs as trauma care providers is also closely related to out-of-hospital availability as well as the increased use of specialists (e.g., GPs) that are not of GP disposal might be drivers of the observed changes.

References


Funding

This study was supported by the National Science Foundation Switzerland (Grant 31003A1431322).

Figure 1: Initial point of care and role of GPs in trauma care (right)

- GPs were the primary care provider in 5% of cases.
- GPs provided follow-up care in 11% of cases.
- GPs had some part in 77% of all accident cases.

Figure 2: Initial point of care by patient profile and region

- Younger patients and those from rural regions are more likely to receive initial care from a GP.
- The role of GPs in trauma care declined from 2008 to 2014.
- The role of hospitals as the first care provider increased from 2008 to 2014.
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
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 %)

<table>
<thead>
<tr>
<th>Agglomeration Size</th>
<th>Male</th>
<th>Female</th>
<th>Swiss Citizen</th>
<th>No Swiss Citizen</th>
<th>≥50'000</th>
<th>≥25'000</th>
<th>≥10'000</th>
<th>≥5'000</th>
<th>&lt;5'000</th>
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- 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.


Fritschi, Caroline Bovet and Peter E Ballmer. 2014. "Vergleich Der Betreuung Ambulanter Notfall-Patienten in Der Hausärztlichen Praxis Und Dem Zentrumsspital." Praxis (16618157) 103(13).


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

incapacity duration

≤3 days

>3 days

≤10 days

CHF
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).
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

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).