



Patterns of older and younger prisoners' primary healthcare utilization in Switzerland

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Running head: Prisoners' primary healthcare utilization

Patterns of older and younger prisoners' primary healthcare utilization in Switzerland



Summary

Purpose: This study identifies primary health concerns prompting older and younger prisoners in Switzerland to consult a nurse or a GP within the prison healthcare setting, and explores if these reasons for visits differ by age group (49 years and younger vs 50 years and older). Fifty years and older was used as the benchmark for older prisoners in light of literature indicating accelerated aging among prisoners.

Methodology: Retrospective information from medical records of 406 prisoners were collected for a period of six months. This study analyzed the reasons for which prisoners visited the nurses and GPs available to them through the prison healthcare service. These reasons were coded using the International Classification of Primary Care version 2 (ICPC-2). Data were analyzed descriptively and four generalized linear models were built to examine whether there was an age group difference in reasons for visiting nurses and GPs.

Findings: The health reasons for visiting nurses and GPs by 380 male prisoners from 13 Swiss prisons are presented. In the six month period, a total of 3309 reasons for visiting nurses and 1648 reasons for visiting GPs were recorded. Prisoner participants' most common reasons for both visits were for general and unspecified complaints and musculoskeletal problems. Older prisoners sought significantly more consultations for cardiovascular and endocrine problems than younger prisoners.

Research Implications: Nurses play an important role in addressing healthcare demands of prisoners and coordinating care in Swiss prisons. In light of age related healthcare demands, continuing education and training of both nurses and GPs to adequately and efficiently address the needs of this prisoner group is critical. Allowing prisoners to carry out some care activities for minor self-manageable complaints will reduce the demand for healthcare.

Originality/Value: This study presents unique data on healthcare concerns for which prisoners visit prison nurses and GPs. It highlights the varied needs of older prisoners as well as how these needs are addressed based on the availability of the primary healthcare provider within the prison.

Key words: healthcare utilization, older prisoners, reasons for visits, prison primary care

Introduction

The health of prisoners is of concern since studies conclude that their healthcare needs are often unmet (Fazel et al., 2004; Wilper et al., 2009). This is a public health issue as prisons present a greater risk for infectious diseases compared with the wider community (Fazel & Baillargeon, 2011). Harsher and longer sentencing laws mean that more individuals are incarcerated and that they age in prison (Human Rights Watch, 2012). The rising number of prisoners and especially older prisoners poses high demands on prison resources and increases healthcare costs (Ahalt et al., 2013; Maschi et al., 2013).

Prisoners' healthcare utilization

Studies on prisoners' healthcare utilization while imprisoned spans over a period of four decades and they conclude that when compared to the general population, prisoners use doctors more often. For instance, Twaddle (1976) found that American prisoners sought general practitioner (GP) care four times the rate of the general population (17.6 times a year). More than two decades later, a United Kingdom (UK) study reported that male prisoners consulted doctors three times the rate of the general population (six times per year) (2001). Similarly, an Italian study revealed that prisoners visited GPs six times in the last year (no comparison was done with the general population) (Nobile et al., 2011). Finally, a Belgian study concluded that prisoners sought GP care 3.8 times more than the general population (17 times a year) (Feron et al., 2005).

Excluding the Swiss study discussed later (Wangmo, Meyer, Handtke, et al., 2015), only one study has captured how often prisoners seek nurses' care within the prison healthcare system. This study from the UK reported that male prisoners visited nurses 23 times in a year representing 77 times more than men in the community (Marshall et al., 2001). They noted that since prisoners cannot take care of their minor ailments such as medications, the demand for care is high as each concern becomes a medicalized encounter.

The higher rates of healthcare utilized by prisoners underscore their greater disease burden when compared to the general population (Fazel & Baillargeon, 2011; Fazel et al., 2001; Meyer, 2015; Wilper et al., 2009). Moreover, the health of older prisoners is poorer than younger prisoners (Baillargeon et al., 2000; Colsher et al., 1992; Fazel et al., 2001) and older prisoners suffer from multiple chronic health problems (Aday, 1994; Deaton et al., 2009-2010; Meyer, 2015). Indeed, a prisoner is considered 'older' at 50 years of age due to accelerated aging experienced by prisoners (Loeb & Abudagga, 2006). That is, on average, prisoners who are 50 years old have a health status that is similar to non-imprisoned persons who are 60 – 65 years old in the community (Loeb et al., 2008; Mitka, 2004). Hypertension, diabetes, ischemic heart disease, and chronic obstructive pulmonary disease are common health concerns of prisoners and their prevalence

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3 increases with age (Baillargeon et al., 2000; Harzke et al., 2010). Mental health conditions are
4 also abundant among prisoners (Butler et al., 2007; Fazel & Danesh, 2002; Fraser, 2009).
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7 **Health and healthcare utilization of prisoners in Switzerland**

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10 In Switzerland, a national project examined the health of older prisoners. It highlighted that older
11 prisoners suffer from more health problems than younger prisoners (4.3 vs 1.6 conditions)
12 (Wangmo, Meyer, Bretschneider, et al., 2015). Similar to earlier studies, the study found that
13 prisoners visited GPs 3.2 times in the last six months, which was twice as often as the general
14 Swiss population (Wangmo, Meyer, Handtke, et al., 2015), a finding considerably less than the
15 above mentioned studies. It further reported that prisoners sought nurse visits 9 times in the last
16 six months, which was more often than GP visits sought by prisoners but much lower than the
17 nurse visits sought in the UK study.
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22 Similar to other studies (Baillargeon et al., 2000; Harzke et al., 2010; Meyer, 2015), older
23 prisoners in Vaud suffered from greater number of musculoskeletal, circulatory, and respiratory
24 problems compared with younger prisoners (Moschetti et al., 2015). Additionally, they were more
25 likely to suffer from back pain, bronchitis, and endocrine disorders. Wolff and colleagues (2011)
26 reported that morbidity was high among prisoners in a remand prison in Geneva (mean age 29.5
27 years) with common concerns being skin, infectious diseases, musculoskeletal, injury-related,
28 respiratory, digestive, and mental health problems.
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34 **Study purpose**

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37 Although there is a growing interest in the health of prisoners in general, little is known about
38 health concerns for which older prisoners seek primary healthcare. Additionally, there is limited
39 study of prisoners' utilization of nursing care over GP care. Given the rising number of older
40 prisoners, there is a need to identify health concerns of this emerging prisoner group and to
41 describe their use of prison healthcare services. The aim of this paper is to identify the primary
42 health concerns prompting prisoners to seek healthcare consultation with GPs and nurses within
43 the prison healthcare setting in Switzerland and to explore if these reasons differed by age group
44 (older prisoners versus younger prisoners).
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50 **Methods**

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52 **Study's inclusion criteria**

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55 At the time of data collection, there were 109 prisons operating in Switzerland of which 26
56 fulfilled the study's inclusion criteria: (a) long-term imprisonment; (b) prisons with more than 20
57 places; and (c) prisons housing older prisoners at the time of request. These 26 prisons held
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3 41.26% of the total prison capacity of 6,968. All 26 prisons were contacted and 15 agreed to
4 participate representing 76.35% of the eligible sample (for details please refer to “Blinded for
5 Review Papers 1 and 2”). The reasons for refusal included prisons’ inability to allocate personnel
6 time and resources necessary to support data collection. Three prisons also reported that they had
7 very few older prisoners who fulfilled our study criteria. Research ethics approval was obtained
8 from the competent 10 regional commissions.
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12 **Retrospective collection of health data**

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15 Retrospective collection of data from prisoners’ medical records began in November 2011 and
16 continued until April 2014. The prison health service provided the project’s two research
17 assistants access to the medical records. They recorded health information using a data extraction
18 sheet. In 14 prisons, data of all older prisoners were collected. Only in one prison which had
19 many older prisoners, data belonging to 50% of the older prisoners were collected. To compare
20 the health information of older prisoners with younger prisoners, an equal amount of data
21 belonging to younger prisoners was randomly gathered. This randomly matched sample of
22 younger prisoners was obtained (wherever possible) by selecting the data of younger prisoner
23 whose name appeared right after the older prisoner whose data was collected for the study. Local
24 prison healthcare service chose the files of the younger prisoners and provided them to the
25 research team (see BLINDED FOR REVIEW Paper 2). For this paper, we analyzed data related
26 to the reasons for visits made to nurses and GPs as evident from the medical records of the
27 prisoners. This data was obtained for a period of six months from the date of data collection. We
28 limited the data collection period because of resource availability.
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38 **Data coding using ICPC-2**

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40 Data were entered into an EpiData file by several assistants. The reasons for visits to nurses and
41 GPs were coded using the International Classification of Primary Care-Version 2 (ICPC-2)
42 (Lamberts & Okkes, 2005; WHO, 2015). The ICPC-2 is used for classifying visits in primary
43 healthcare (Chmiel et al., 2011; Laux et al., 2007; Okkes et al., 2002; Soler et al., 2012) and more
44 recently by studies with prisoners (Eytan et al., 2011; Gisin et al., 2012; Haller et al., 2010; Wolff
45 et al., 2011). According to ICPC-2, a visit is defined as the contact or professional exchange
46 between a primary healthcare provider and a patient (Bhend, 2008; Körner et al., 2005). Each
47 visit is characterized by three elements: patient’s motivation to go to the doctor that is, the reason
48 for encounter, the doctor’s assessment of the problem (diagnosis), and the steps that are taken to
49 help the patient (process). It allows coding for more than one reason, diagnosis, and process per
50 visit¹. SH examined all relevant data for this paper to ensure accuracy and consistency. ICPC-2 is
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59 ¹ It could be that a prisoner presented more than one reason when seeing a nurse or GP. However, this differentiation
60 cannot be teased because we did not record the date of each visit during data extraction.

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3 a biaxial coding system that has 17 chapters with an alphabetical code based on body systems or
4 problem area (Lamberts & Okkes, 2005; Laux et al., 2007; WHO, 2015) and a second axis is
5 given by a 2-digit number and has seven components (WHO, 2015).
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8 **Data analysis**

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11 Descriptive statistics were used to explore the reasons for which healthcare was consumed: first
12 using the seven components of ICPC-2 for the sample and later to explore if there was a
13 difference in healthcare utilization by age group. In addition, we assessed whether the number of
14 visits to nurses and GPs reported within the last six months differed between younger and older
15 prisoners. For this purpose, we used generalized linear models (GLMs). The number of reasons
16 for visits to nurses and number of visits to GPs within the last six months were two response
17 variables in two separate GLMs. Age group (49 years and younger versus 50 years and older) was
18 included as predictor variable in each GLM and participating prisons was included as a block
19 variable to account for nuisance variability caused by differences among the 13 prisons. For each
20 response variable, two different GLMs were tested: (1) a weak model where all 13 institutions
21 were included, and (2) a strong model with only 3 institutions that provided the most data (i.e.
22 where more than 40 prisoners data were collected). For all four models (one strong and one weak
23 for each response variable), we analysed age group difference for 7 of the 17 chapters of ICPC-2
24 that most affected our sample: general and unspecified, cardiovascular, musculoskeletal,
25 respiratory, digestive, skin, and endocrine, metabolic and nutritional. All analyses were
26 performed using IBM SPSS 22.0.
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37 Since data for healthcare utilization was captured for the previous six months' period but some
38 participants had spent less than 6 months in prison, the time span over which data were gathered
39 was used as an offset variable². As both response variables reflected counts, we assumed a
40 negative binomial distribution in order to account for potential over dispersion. We report robust
41 standard errors for the parameter estimates.
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45 **Results**

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47 Of the 406 medical records collected, 380 were that of male prisoners from 13 prisons and only
48 26 prisoners were female from two prisons. To form a homogenous comparison group and
49 because women comprised only 6% of the sample, they were excluded from the analysis. From
50 the male prisoners, equal amounts of data belonged to older and younger prisoners (190 in each
51 group). The mean age of the older prisoners was 58.8 years (s.d. 5.8 years) and younger prisoners
52 were on average 34.3 years old (s.d. 7.4 years) (see Blinded for Peer Review Paper 1 and 2 for
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59 ² Here the offset variables relates to the time period over which data were recorded. It takes into account the fact that
60 for some participants, data were available across a shorter time period than 6 months and accordingly controls for this.

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3 detailed demographic information of the sample, disease burden, and total visits to the primary
4 healthcare providers).

7 **Prisoners' overall pattern of healthcare utilization**

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10 During the data collection period of six months, a total of 3309 reasons for visits were recorded
11 for nurse visits delineating 374 different problems and complaints. Half of the reasons for visits
12 (52%) were for 30 different ICPC-2 codes. The most common reasons for nurse visits were:
13 medical examinations for cardiovascular issues (n=249); medications (n=188); consult with
14 primary care provider (n=127; follow up encounter unspecified (n=89); and compliance/being ill
15 problem (n=77) (Table 1).
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20 [TABLE 1]

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22 In the same period of data collection, for visits to GPs, a total of 1648 reasons for visits were
23 recorded for 325 different problems and complaints. Approximately half of these reasons (47%)
24 corresponded to 30 ICPC-2 codes. The five most common reasons for GP visits were: follow-up
25 encounter unspecified (n=85); cough (n=54); headache (n=46); pain general/multiple sites (n=41);
26 and throat symptoms and complaint (n=37) (Table 1).
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31 When categorizing these reasons for visits into 7 components of the ICPC-2, 37.3% of visits to
32 nurses and more than half (58.7%) of visits to GPs were made for symptoms and complaints
33 (Figure 1). Nurses were seen more frequently for diagnostic, screening and preventive procedures
34 (7 times), and medication procedures (6 times) than GPs.
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38 [FIGURE 1]

40 **Reasons for nurse visits in the last six months**

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43 Upon assessing the reasons for visits recorded in the medical records using ICPC-2 chapters,
44 older prisoners' most frequent problems included: (1) general and unspecified; (2) cardiovascular;
45 (3) musculoskeletal; (4) endocrine, metabolic and nutritional; and (5) digestive (Table 2). For
46 several chapters of ICPC-2, the prisoners needed repeated care (i.e., total number of visits /
47 number of persons who sought care). An older prisoner was seen by a nurse for a problem
48 belonging to general and unspecified complaints, cardiovascular, and endocrine problems 5.4,
49 five, and 4.1 times respectively.
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54 [TABLE 2]

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57 The most common reasons for which nurses provided care to younger prisoners were: (1) general
58 and unspecified; (2) musculoskeletal; (3) digestive; (4) skin; and (5) respiratory. A younger
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prisoner visited the nurse between three to 4.1 times for the above five most common reasons for visits.

Reasons for visiting a GP in the last six months

The most common reasons for which older prisoners' saw GPs were: (1) general and unspecified; (2) musculoskeletal; (3) respiratory; (4) cardiovascular; and (5) skin (Table 3). Only for respiratory problems repeated care was sought 3.6 times. For the remaining four chapters, they returned to a GP two to three times. Younger prisoners visited GPs for the following health concerns: (1) musculoskeletal; (2) general and unspecified; (3) respiratory; (4) digestive; and (5) skin. Younger prisoners sought repeated care for the above mentioned reasons between two to three times.

[TABLE 3]

Age group difference – patterns of visit to nurses and GPs

When all 13 prisons were included, older prisoners consulted nurses significantly more often than younger prisoners for the following ICPC-2 chapters: (1) general and unspecified; (2) cardiovascular problems; and (3) endocrine, metabolic and nutritional concerns (Table 4). When the three largest prisons were kept, the results changed somewhat. For instance, general and unspecified category was no longer significant in the strong model due to the slightly increased confidence interval compared to that in the weak model. Digestive concerns in contrast became significant ($p=0.029$), and cardiovascular and endocrine, metabolic and nutritional problems became highly significant with $p<0.001$ for both.

[TABLE 4]

The results are similar for reasons for visiting GPs (Table 5). In the weak model with all prisons, a significant age group difference was evident for three of the seven ICPC-2 chapters: (1) general and unspecified; (2) cardiovascular; and (3) endocrine, metabolic, and nutritional. The strong model revealed an additional ICPC-2 chapter with significant result: general and unspecified, $p=0.012$; cardiovascular, $p=0.003$; musculoskeletal: $p=0.023$; and endocrine, metabolic and nutritional, $p=0.024$.

[TABLE 5]

Discussion

The results show that prisoners saw nurses twice as much as GPs in the prison healthcare setting. The higher number of visits to nurses are very likely related to the fact that nurses are more

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3 regularly present in the participating Swiss prisons than GPs (Paper 2 Blinded for Review).
4 Nurses were available on a full-time basis in most of the participating prisons, while only one of
5 the 13 prisons had a full-time GP available on site, with others providing GP access on a part-
6 time basis only. In light of availability of GPs or nurses, consultation with either one is often
7 regulated by a gatekeeper system where nurses refer patients to a GP. However, in urgent and
8 sufficiently severe situations or for follow up consultations planned directly by the GP for his or
9 her patients, including routine evaluations (e.g. whether a detainee is healthy enough to work in
10 the kitchen), inmates will see a GP without first having been evaluated by a nurse. It could be that
11 prisoners wished to seek GP care, but due to their limited availability on site or because the nurse
12 down-prioritized his case on the waiting list of a GP, they had no other choice but to discuss their
13 concerns with the nurse. However, if prisoners insist on consultation with a GP, nurses would
14 arrange for the next possible visit. No published literature to date provides any information on the
15 roles of nurses in Swiss prisons. Based on our personal experience, we note that in general, prison
16 nurses must decide which prisoners should seek GP visits based on the severity of the illness.
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25 Across the board of reasons for seeking care within the prison healthcare service, findings
26 indicate that nurses most often performed tasks and examinations related to cardiovascular
27 problems, dispensed medications, and provided primary care consultations as compared with GPs
28 who were most often seen for follow-up visits, coughs, and headaches. These contacts to nurses
29 for medications and cardiovascular examinations (mostly checking blood pressure), and GPs for
30 minor symptoms points toward the inability of prisoners to address these concerns that a person in
31 the community could easily do (Marshall et al., 2001). In the comparison of reasons for visits
32 made to nurses and GPs, a certain specialization can be observed. The high number of visits for
33 medications and examinations, but also for cardiovascular and endocrine problems reveal that
34 nurses are responding to most visits for chronic diseases.
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42 Furthermore, given the high prevalence of comorbidities such as anxiety and depression in prison
43 (Elger, 2004), some of the somatic problems could be an indication of somatization of
44 psychological symptoms. Another problem in many prisons is that detainees lack contact with
45 friends and families as well as constructive activities that nurse visits become the only means for
46 “normal” social contact (Feron et al., 2005; Marshall et al., 2001).
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50 Results from our retrospective collection of data from medical records of prisoners highlight that
51 older prisoners consulted with prison nurses frequently for general and unspecified reasons,
52 cardiovascular complaints, and endocrine problems. They repeatedly went to prison GPs for
53 respiratory illness and skin problems. Older prisoners visited nurses significantly more for
54 cardiovascular, endocrine, and digestive problems than younger prisoners. A significant age
55 group difference in visiting GPs was evident for general and unspecified reasons, cardiovascular,
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3 musculoskeletal, and endocrine problems. The higher demand for healthcare for certain categories
4 of ICPC-2, particularly, cardiovascular and endocrine concerns, underscore the differential and
5 age specific healthcare needs of older prisoners (Meyer, 2015; Moschetti et al., 2015; Wangmo,
6 Meyer, Bretschneider, et al., 2015).
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10 Similar to previous studies (Feron et al., 2005; Wolff et al., 2011), musculoskeletal, respiratory,
11 digestive, and skin problems were among the most prevalent reasons for GP visits in our sample.
12 Other common reasons included general and unspecified as well as cardiovascular problems.
13 Seeking care for cardiovascular reasons is attributable to our older prisoner sample (34 years
14 (Feron et al., 2005), 29.5 years (Wolff et al., 2011) compared to 46.5 years of our sample
15 (Blinded for Review)). Moreover, the most common reasons for visit to prison GPs by our sample
16 are comparable with studies from the general population that revealed cardiovascular and
17 musculoskeletal problems (Chmiel et al., 2011), general and unspecified, respiratory, and
18 musculoskeletal concerns as the most common reasons for visiting GPs (Meynard et al., 2015).
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25 **Limitations**

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27 First, 11 prisons did not participate in this study and since they comprised only a quarter of the
28 eligible sample, we do not believe that their patterns of healthcare usage would be radically
29 different. This is because our study sample included both open and closed prisons and those that
30 refused also consisted of both prison types. Additionally, their refusal was not related to reasons
31 that may be deemed highlighting the shortcomings of their prison healthcare setting. Second,
32 there could be errors associated with data entry, however, multiple assistants double checked all
33 data entries to detect any errors and corrected them. Third, unlike studies that captured reasons for
34 seeking primary care based on an episode of care (Soler et al., 2012), we were unable to do that.
35 This was because of limited resources available for the project as well as an inability to
36 retrospectively connect each related visit to construct an episode of care. Finally, health problems
37 reported when seeking GP visits in the Belgian study were mental health problems, digestive
38 concerns, musculoskeletal, and skin problems (Feron et al., 2005). Similar was the finding from a
39 Swiss study that revealed that mental health problems are prevalent along with somatic conditions
40 (Wolff et al., 2011). But mental health problems were not among the most common reasons for
41 visiting prison GPs or nurses in our sample. This could be because mental health data were not
42 stored within the prison healthcare setting in all participating prisons (Blinded for Review Paper 1
43 and 2) and thus we have an under-representation of mental health problems. We acknowledge that
44 mental health and associated prescriptions of psychoactive drugs is a major concern of prison
45 health systems (Elger et al., 2004; Elger et al., 2002; Feron et al., 2005), and thus a deeper
46 examination of older prisoners' mental health concerns would be a fruitful evaluation.
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59 **Conclusion**

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3 From our data we are unable to judge whether healthcare is adequate in Swiss prisons (see
4 literature on unmet health care (Fazel et al., 2004)). We conclude that prison nurses play an
5 important role in the provision of healthcare to prisoners and have significant responsibility in
6 Swiss prisons as they coordinate care requests. This role as gatekeepers of care underscores the
7 need to strengthen their responsibilities to lead preventative healthcare activities. Furthermore,
8 continuing education of primary healthcare providers in the correctional settings to adapt to the
9 changing needs of the prisoner population is critical. Training prison nurses to address minor
10 health concerns efficiently and to identify prisoners who need GP or specialist care rapidly would
11 improve quality of care.
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18 In light of the worldwide increasing number of prisoners incarcerated and those aging in prison
19 (Human Rights Watch, 2012), the demand for and cost of prison healthcare will increase. Similar
20 is expected in Switzerland due to health condition of older prisoners (Wangmo, Meyer,
21 Bretschneider, et al., 2015), their healthcare utilization (Wangmo, Meyer, Handtke, et al., 2015),
22 compounded with strict sentencing laws. Moreover, lack of social activities and opportunities for
23 self-care adds to this demand and healthcare expenditures. Appropriate and flexible activities for
24 prisoners may address some concerns (Harrison, 2006; Loeb & Steffensmeier, 2011). These
25 activities could include opportunities to form interest groups in prisons where older prisoners can
26 come together to play sports of their choice; and engage in social activities such as group
27 exercise, music, reading, and preparing meals. Finally, enabling prisoners to carry out (safe) self-
28 care activities for minor manageable complaints will reduce the demand for healthcare.
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Table 1: Ten most common ICPC-2 codes reported by prisoners within the previous six months

Reasons for visiting nurses (n=3309)			Reasons for visiting GPs (n=1648)		
ICPC-code	Specific problem	n	ICPC-code	Specific problem	n
K31	Medical examination (for cardiovascular problem)	249	A63	Follow up encounter (for general and unspecified problem)	85
A50	Medication (for general and unspecified problem)	188	R05	Cough	54
A46	Consult with primary healthcare provider (for general and unspecified problem)	127	N01	Headache	46
A63	Follow up encounter (for general and unspecified problem)	89	A01	Pain general/multiple sites (for general and unspecified problem)	41
Z11	Compliance or being ill problem	77	R21	Throat symptom/complaints	37
N01	Headache	71	A04	Weakness/Tiredness general	36
T31	Medical examination (for endocrine problem)	71	L08	Shoulder symptoms	33
A34	Blood test (for general and unspecified problem)	63	L15	Knee symptoms	32
S56	Treatment (dress/press for skin problems)	62	R07	Sneezing/nasal congestion	31
P50	Medication (for psychological problem)	52	L02	Back symptom/Complaints	30

Table 2. Reasons for visiting a nurse within the previous six months

ICPC-2 CHAPTERS	Younger prisoners*		Older prisoners*	
	<i>n</i> Total reasons (<i>n</i> persons)	Repeat visits	<i>n</i> Total reasons (<i>n</i> persons)	Repeat visits
General and unspecified reason	307 (85)	3.6	491 (91)	5.4
Blood, blood forming organs and immune mechanism	12 (4)	3.0	23 (6)	3.8
Digestive	196 (54)	3.6	111 (38)	2.9
Eye	40 (24)	1.7	39 (20)	1.9
Ear	13 (7)	1.8	22 (10)	2.2
Cardiovascular	39 (19)	2.0	311 (62)	5.0
Musculoskeletal	219 (60)	3.6	200 (52)	3.8
Neurological	64 (31)	2.1	89 (25)	3.6
Psychological	131 (32)	4.1	45 (21)	2.1
Respiratory	140 (45)	3.1	100 (35)	2.8
Skin	183 (50)	3.6	99 (30)	3.3
Endocrine, metabolic and nutritional	37 (13)	2.8	156 (38)	4.1
Urological	14 (7)	2.0	27 (9)	3.0
Male Genital	12 (9)	1.3	11 (5)	2.2
Social Problems	97 (41)	2.4	81 (47)	1.7

*A total of 1504 reasons for visiting a nurse was reported by younger prisoners and 1805 reasons by older prisoners.

Five most common reasons bolded for each column.

Table 3. Reasons for visiting a GP within the previous six months

ICPC-2 CHAPTERS	Younger prisoners*		Older prisoners*	
	<i>n</i> Total reasons (<i>n</i> persons)	Repeat visits	<i>n</i> Total reasons (<i>n</i> persons)	Repeat visits
General and unspecified reason	116 (50)	2.3	210 (73)	2.8
Blood, blood forming organs and immune mechanism	6 (5)	1.2	6 (4)	1.5
Digestive	88 (32)	2.7	48 (21)	2.3
Eye	10 (8)	1.2	8 (8)	1.0
Ear	6 (5)	1.2	21 (14)	1.5
Cardiovascular	14 (6)	2.3	94 (36)	2.6
Musculoskeletal	168 (64)	2.6	156 (58)	2.6
Neurological	39 (25)	1.6	42 (26)	1.6
Psychological	31 (21)	1.5	27 (16)	1.7
Respiratory	96 (35)	2.7	132 (36)	3.7
Skin	75 (41)	1.8	60 (22)	2.7
Endocrine, metabolic and nutritional	13 (11)	1.2	44 (22)	2.0
Urological	11 (6)	1.8	18 (9)	2.0
Male Genital	12 (7)	1.7	13 (7)	1.8
Social Problems	43 (16)	2.7	41 (24)	1.7

*A total of 728 reasons for visiting a GP was reported by younger prisoners and 920 reasons by older prisoners.

Five most common reasons bolded for each column.

Table 4. Younger and older prisoners' visits to a nurse within the previous six months for seven ICPC-2 chapters

	Weak model	Strong model
	RR (CI)	RR (CI)
General and unspecified	1.493 (1.078/2.068)*	1.496 (0.950/2.357)
Digestive	0.588 (0.345/1.002)	0.401 (0.177/0.910)*
Cardiovascular	8.735 (4.572/16.690)***	10.538 (4.574/24.278)***
Musculoskeletal	0.923 (0.593/1.436)	0.640 (0.330/1.241)
Respiratory	0.682 (0.378/1.229)	1.374 (0.680/2.776)
Skin	0.513 (0.219/1.200)	0.581 (0.153/2.214)
Endocrine, metabolic and nutritional	3.777 (1.429/9.985)**	8.218 (3.158/21.385)***

Note. Risk ratios (RR) denote by which factor older prisoners made more visits compared to younger prisoners.

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

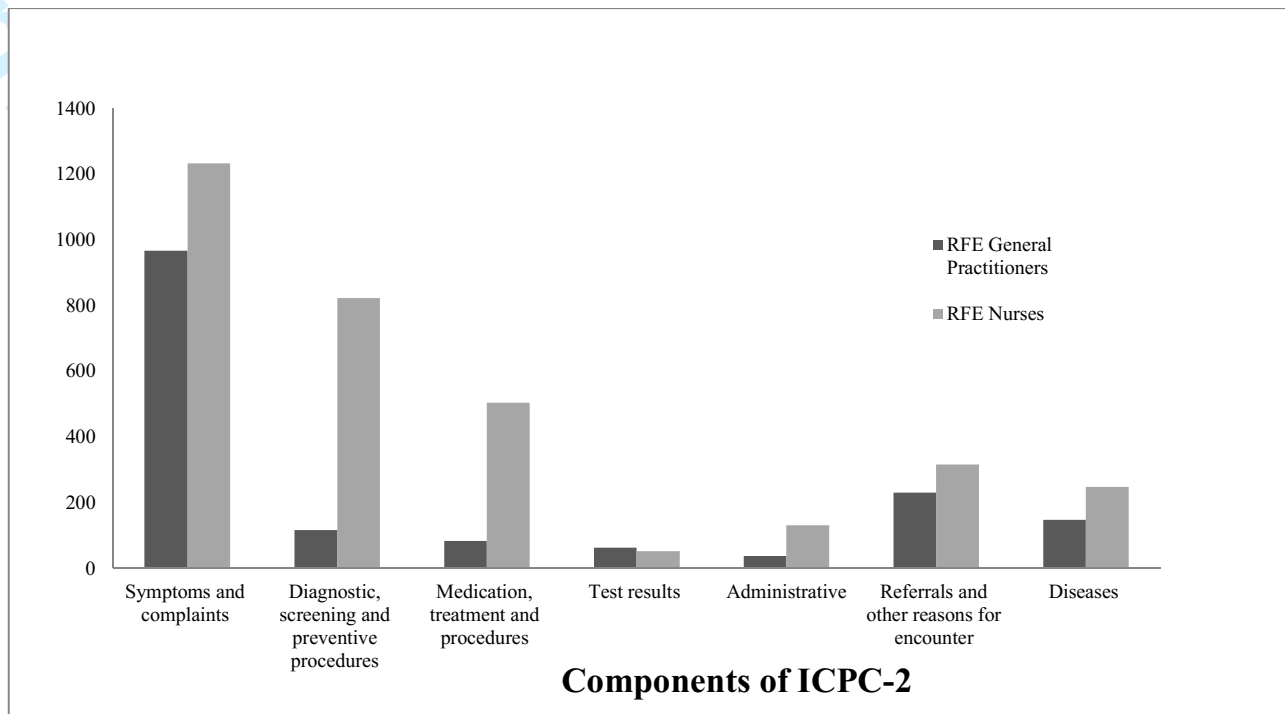
Table 5. Younger and older prisoners' visits to a GP within the previous six months for seven ICPC-2 chapters

	Weak model	Strong model
	RR (CI)	RR (CI)
General and unspecified	1.759 (1.250/2.475)***	1.654 (1.115/2.454)*
Digestive	0.561 (0.260/1.212)	0.578 (0.232/1.442)
Cardiovascular	6.644 (2.266/19.481)***	5.255 (1.752/15.756)**
Musculoskeletal	0.796 (0.557/1.137)	0.597 (0.382/0.933)*
Respiratory	1.164 (0.692/1.959)	1.259 (0.745/2.129)
Skin	0.795 (0.412/1.535)	0.845 (0.384/1.858)
Endocrine, metabolic and nutritional	3.152 (1.430/6.945)**	2.806 (1.147/6.861)*

Note. Risk ratios (RR) denote by which factor older prisoners made more visits compared to younger prisoners.

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Figure 1. Visits to a nurse (n=3309) and GP (n=1648) within the past six months by ICPC-2 component



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