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# AHRQ prevention quality indicators to assess the quality of primary care of local providers: a pilot study from Italy

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**Background:** Outside the USA, Agency for Healthcare Research and Quality (AHRQ) prevention quality indicators (PQIs) have been used to compare the quality of primary care services only at a national or regional level. However, in several national health systems, primary care is not directly managed by the regions but is in charge of smaller territorial entities. We evaluated whether PQIs might be used to compare the performance of local providers such as Italian local health authorities (LHAs) and health districts. **Methods:** We analysed the hospital discharge abstracts of 44 LHAs (and 11 health districts) of five Italian regions (including ≈18 million residents) in 2008–10. Age-standardized PQI rates were computed following AHRQ specifications. Potential predictors were investigated using multilevel modelling. **Results:** We analysed 11 470 722 hospitalizations. The overall rates of preventable hospitalizations (composite PQI 90) were 1012, 889 and 988 (×100 000 inhabitants) in 2008, 2009 and 2010, respectively. Composite PQIs were able to differentiate LHAs and health districts and showed small variation in the performance ranking over years. **Conclusion:** Although further research is required, our findings support the use of composite PQIs to evaluate the performance of relatively small primary health care providers (50 000–60 000 enrollees) in countries with universal health care coverage. Achieving high precision may be crucial for a structured quality assessment system to align hospitalization rate indicators with measures of other contexts of care (cost, clinical management, satisfaction/experience) that are typically computed at a local level.

## Introduction

The assessment of the quality of health care has been a problematic issue for decades and in all settings,<sup>1,2</sup> including primary care.<sup>3–5</sup> Starting from the 1970s,<sup>6</sup> a number of quality indicators for primary health care has been proposed,<sup>7</sup> but their validity has often remained questionable.<sup>3,8,9</sup> An important progress was achieved in the early 1990s with the concept of 'potentially avoidable' or 'ambulatory care sensitive' hospitalizations,<sup>10</sup> which were extensively used to indirectly evaluate the performance of primary health care in several countries.<sup>11–16</sup>

Based on the assumption that the hospitalization for several chronic and acute conditions can be prevented with timely and appropriate ambulatory care,<sup>17</sup> the Agency for Healthcare Research and Quality (AHRQ) developed a set of 14 primary care quality measures, named 'prevention quality indicators' (PQIs), which were first released in 2000<sup>18</sup> and which have been validated in the USA to compare the performance of national<sup>19–28</sup> and local (counties)<sup>29–31</sup> providers.

Some of the PQIs were also used in Italy to compare the quality of primary health care across the regions.<sup>32–35</sup> However, in the Italian National Health System (NHS), primary care services are not directly managed by the regions, but they are in charge of both

local health authorities (LHAs) and smaller entities within each LHA named health districts (counting ~50 000–60 000 inhabitants on average).<sup>36</sup> Thus, regional-level comparison may provide limited information.

The present analysis of the hospital admissions of five Italian regions for the years 2008–10 was aimed at evaluating for the first time whether PQIs may be used to compare the quality of primary health care of smaller territorial entities such as LHA and health districts within the Italian NHS.

## Methods

The list of all PQIs is reported in box 1. We computed all composite and 13 of the 14 individual PQIs: PQI 9 (low birth weight rate) was excluded because we only obtained data of the admissions of people aged ≥18 years. To compute PQIs, we followed strictly AHRQ technical specifications,<sup>37</sup> and all details have been reported at the end of the Supplementary Appendix.

In brief, with the exception of PQI 2, which is a percentage, each PQI is a ratio between the number of hospital admissions for specific disease, and the total number of residents, aged ≥18 years, in a metro area or county.<sup>17</sup> For our analyses, each LHA (the Italian

ASL) was a separate metro area, and every PQI was computed for each LHA. Thus, each PQI was the rate of admission for a specific disease of all the residents of a single LHA ( $\times 100\,000$ ).

Hospital discharge abstracts were officially provided by the General Directorate for Health Planning of the Italian Ministry of Health, which granted the permission to extract the data of the 44 LHA of four Italian regions (Abruzzo, Emilia-Romagna, Lazio and Lombardia) and the city of Trieste, for the triennium 2008–10.

The number of residents of each LHA, with age and gender strata, was extracted both from publicly available data sets of the National Institute of Statistics (Istat)<sup>38</sup> and from other demographic data sets provided by the Italian Ministry of Health. For each PQI, once the crude admission rates were obtained for each PQI, they were age-standardized using an indirect method and 10-year age

classes. We also computed the standardized admission rates for the three composite PQI measures PQI 90, PQI 91 and PQI 92.<sup>39</sup> PQI 90 represents the overall measure of quality, and it is the sum of the numerators of all the individual indicators (excluding PQIs 2, 13 and 14). PQI 91 and PQI 92 are the sum of the admission rates for acute and chronic conditions, respectively.

We computed the PQIs, as described above, also for each health district (as a metro area) to evaluate whether at least some of the indicators had enough statistical power to be used for comparing smaller territorial entities. Unfortunately, we were able to retrieve the information on patient's health district only for a few LHAs of the Abruzzo region ( $n=7$ ) and the city of Trieste ( $n=4$ ) because Italian hospital discharge abstracts do not contain such information, which must be obtained, with permission, from single LHAs.

The computation of age- and sex-standardized PQIs by LHA was demanding: for each LHA ( $n=44$ ), in each year ( $n=3$ ), demographic and admission data need to be extracted and tabulated in several strata (two genders and seven 10-year age classes) for each PQI ( $n=16$ ). Thus, the overall number of cells to deal with is 29 568 ( $44 \times 3 \times 16 \times 2 \times 7$  cells). This is even more complex when the unit of the analysis is the health district because there are several districts in each LHA. In our analysis, we initially observed no influence of gender on the estimates of a pilot analysis on five LHAs from all regions, and thus we did not standardize by gender.

As a secondary analysis, we investigated to what extent composite PQIs were correlated with the overall admission rates (once excluded Ambulatory Care Sensitive Conditions (ACSCs)), that is, whether PQIs did represent a meaningful measure or we could simply use the overall admission rate as a proxy of the efficacy/efficiency of the primary health care services. Besides an initial univariate analysis based on Spearman correlation coefficient, we fitted three random-effects linear regression models, in which the dependent variables were the three composite PQIs (PQI 90, 91 and 92) in the triennium 2008–10. For all models, the cluster units were single LHAs (health districts were too few to allow meaningful multivariate analyses) and the independent variables were overall LHA hospitalization rate (excluding ACSCs), LHA total population, year and region. Because of the hierarchical structure of our data, in which regions, LHA and years represent different levels with potential intra-cluster correlations,<sup>40</sup> the analysis was repeated using a random-effects multilevel model with three levels of cluster (year, region and LHA). Because the

### Box 1 List of the PQI measures, both individual and composite

#### Individual measures:

- PQI 1—Diabetes short-term complications;
- PQI 2—Perforated appendix;
- PQI 3—Diabetes long-term complications;
- PQI 5—Chronic obstructive pulmonary disease or Asthma in older adults;
- PQI 7—Hypertension;
- PQI 8—Congestive heart failure;
- PQI 10—Dehydration;
- PQI 11—Bacterial pneumonia;
- PQI 12—Urinary tract infection;
- PQI 13—Angina without procedure;
- PQI 14—Uncontrolled diabetes;
- PQI 15—Asthma in younger adults;
- PQI 16—Rate of lower-extremity amputation among diabetics.

#### Composite measures:

- PQI 90—Overall PQI composite (PQIs 1, 3, 5, 7, 8, 10, 11, 12, 15, 16)
- PQI 91—Acute PQI composite (PQIs 10, 11, 12)
- PQI 92—Chronic PQI composite (PQIs 1, 3, 5, 7, 8, 15, 16)
- PQI 'Trinity' (PQIs 5, 8, 11)

**Table 1** PQIs: hospital admission rates in Italy (2008–10) and the USA (2008–09)

Indicators (admission rates $\times 100\,000$ )	Italy <sup>a</sup>			$\Delta$ % 2008–10	USA 2008	Comparison USA vs. Italy, % 2008	USA 2009	Comparison USA vs. Italy, % 2009
	2008	2009	2010					
PQI 1—Diabetes short-term complications	12	10	10	–16.7	62	+416.7	62	+520.0
PQI 2—Perforated appendix (%)	29	30	31	+8.1	28	–3.4	29	–3.3
PQI 3—Diabetes long-term complications	76	57	69	–9.2	129	+69.7	118	+107.0
PQI 5—Chronic obstructive pulmonary disease or asthma in older adults	188	159	154	–18.1	578	+207.4	559	+251.6
PQI 7—Hypertension	36	39	46	+27.8	62	+72.2	63	+61.5
PQI 8—Congestive heart failure	336	301	399	+18.8	400	+19.0	381	+26.6
PQI 10—Dehydration	27	23	28	+3.7	176	+551.9	139	+504.3
PQI 11—Bacterial pneumonia	181	183	205	+13.3	362	+100.0	336	+83.6
PQI 12—Urinary tract infection	59	59	65	+10.2	206	+249.2	197	+233.9
PQI 13—Angina without procedures	114	98	104	–8.8	25	–78.1	23	–76.5
PQI 14—Uncontrolled diabetes	51	41	45	–11.8	23	–54.9	22	–46.3
PQI 15—Asthma in younger adults	48	30	41	–14.6	60	+25.0	63	+110.0
PQI 16—Rate of lower-extremity amputation among diabetics	7	7	7	0.0	18	+157.1	17	+142.9
PQI 90—Overall PQI composite	1012	889	988	–2.4	1825	+80.3	1714	+92.8
PQI 91—Acute PQI composite	250	268	282	+12.2	744	+197.6	672	+150.7
PQI 92—Chronic PQI composite	761	640	705	–7.4	1081	+42.0	1042	+62.8

a: Abruzzo, Lazio, Emilia-Romagna, Lombardy and the city of Trieste.

results for the remaining covariates (hospitalization rate and total population) were similar, only the results of the simpler regression model were shown to avoid redundancy.

All analyses were carried out using Stata software, version 11 (Stata Corporation, College Station, Texas, USA, 2007). The study protocol was approved by the ethics committee of the Sapienza University of Rome (prot. n. 657/12, 19 July 2012).

## Results

### Study sample and comparison among regions and the USA

We applied the algorithm to compute PQIs to all the 11 470 722 hospitalizations that took place in the five selected regions (including ~18 million residents), between 2008 and 2010 (Supplementary table S1). Overall, the prevalence of admissions for ACSC according to AHRQ criteria<sup>17</sup> was 5.7% (n = 648 180), ranging from 4.9 to 9.7% across regions and years.

The hospitalization rates for composite PQIs have been reported in table 1 (overall), Supplementary table S2 (stratified by region), figure 1 and Supplementary figures S1 and S2 (stratified by LHA) and figure 2 and Supplementary figures S3 and S4 (stratified by district). The overall hospitalization rates for ACSC (composite PQI 90) were consistently different across regions during the study period, with Abruzzo and Trieste showing rates that were 15–25% higher, on average, than those from Lazio and Lombardy (Supplementary table S2).

From 2008 to 2010, the overall hospitalization rates for acute (PQI 91) and chronic (PQI 92) conditions showed opposite trends: in all areas, PQI 91 increased (+12.2% overall; ranging from +3.9% in Trieste—in which the rate was already high—to +15.5% in Lazio) while PQI 92 decreased (–7.4% overall; ranging from –4.3% in Emilia-Romagna to –16.5% in Trieste—Supplementary table S2).

When compared with the USA (table 1), the rates of PQIs of the included Italian regions were generally lower or extremely lower, with the exception of the admissions for angina without procedures (PQI 13) and uncontrolled diabetes (PQI 14), which were higher than in the USA. In the years 2008 and 2009 (last available for the USA), the overall rate of potentially preventable hospitalizations (composite PQI 90) of the USA was 80.3 and 92.8% higher than Italian regions, respectively (table 1).

### Use of PQIs to compare local-level providers

The overall hospitalization rates for ACSC (composite PQI 90) for each of the 44 included LHAs, in each year, have been reported in figure 1. LHAs showed relevant (and significant) differences among each other: the rate between the highest and lowest LHA value each year ranged from 2.20 to 2.33. A similar scenario was observed for PQIs 91 (acute conditions only) and 92 (chronic conditions only)—Supplementary figures S1 and S2, respectively. Somewhat smaller differences in PQI 90 values were observed across health districts (figure 2), although the ‘best/worst’ admission rate never fell below 1.97 in the triennium. Again, a comparable picture was obtained when analysing PQIs 91 and 92 (Supplementary figures S3 and S4, respectively).

With regard to stability over years, which would be presumable given the complex multidisciplinary nature of PQIs and the time needed to observe the effects of interventions on health services, most of the LHAs and health districts showed little variation in composite PQIs’ values over the triennium (figures 1 and 2 and Supplementary figures S1–S4). Moreover, the rank of most LHAs (69.8–76.7%) or districts (83.8–100%) showed small variation across the 3 years (Supplementary table S3), indicating that the ranking of the performance of LHAs or health districts based on composite PQIs is generally stable.

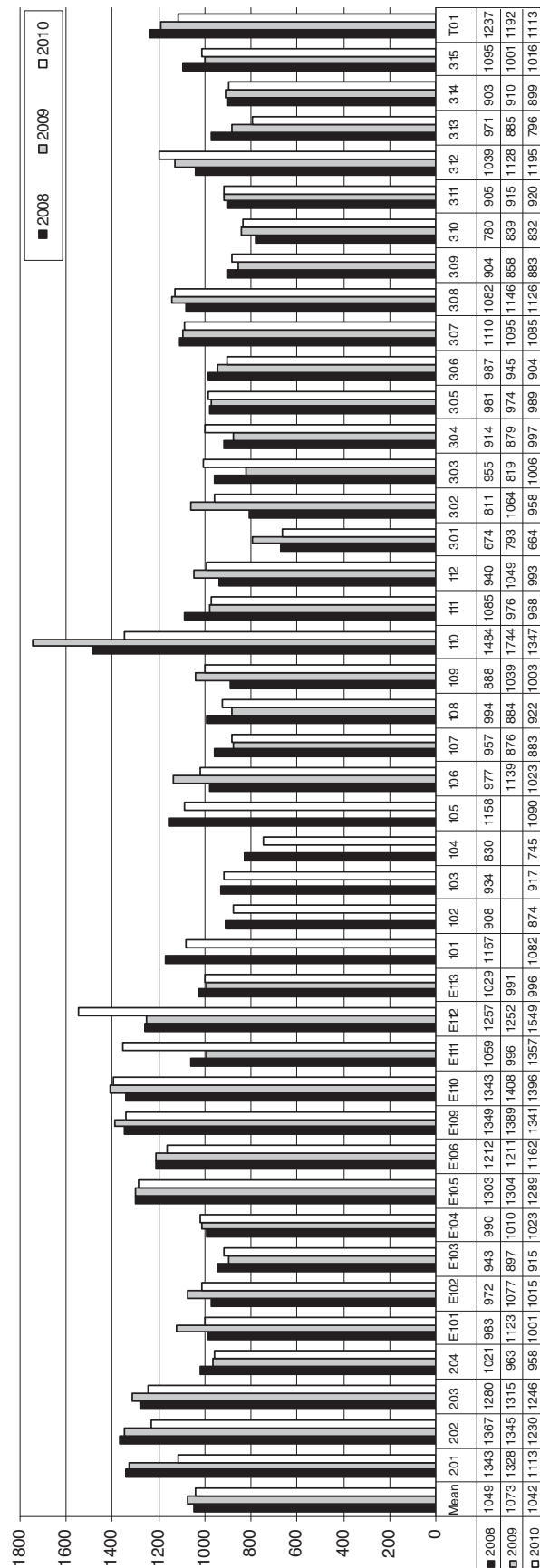
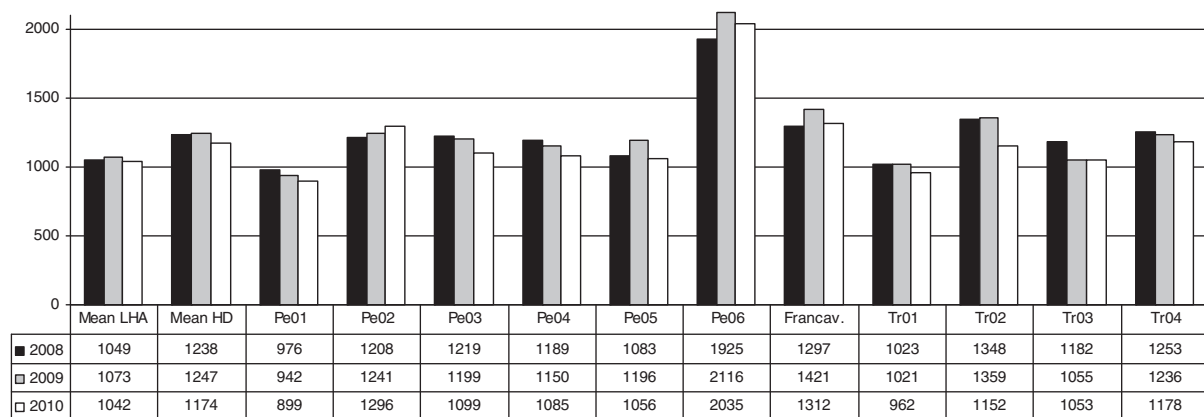


Figure 1 PQIs: PQI 90—overall hospitalization rates for ambulatory care sensitive conditions in 44 LHAs from five Italian regions (Abruzzo: LHAs 201–204; Emilia-Romagna: E101–E113; Lazio: 101–112; Lombardy: 301–315; Trieste: T01); years 2008–10. Data of the local health units 101–105 of the Lazio region (City of Rome) for the year 2009 were not available



**Figure 2** PQIs: PQI 90—overall hospitalization rates for ambulatory care sensitive conditions in 11 health districts from three Italian LHAs (LHA of Pescara: Pe01–Pe06; LHA of Lanciano-Vasto-Chieti: district of Francavilla; LHA of Trieste: Tr01–Tr04); years 2008–10

**Table 2** Potential predictors of the rate of hospitalization for an ambulatory care sensitive condition (PQIs 90, 91 and 92) in the years 2008–10

Variables	PQI 90 (overall)		PQI 91 (acute)		PQI 92 (chronic)	
	Coeff.	(P)	Coeff.	(P)	Coeff.	(P)
Rate of all hospitalizations excluding PQI conditions (10 × 1000), 10-unit increase	0.27	(0.020)	0.16	(0.036)	0.15	(0.029)
Total population, 1000-resident increase	−0.10	(0.2)	−0.08	(0.051)	−0.02	(0.8)
Year, 1-year increase	10.1	(0.3)	27.3	(0.001)	−15.0	(0.011)

Coeff. = regression coefficient.

Random-effects linear regression with one level of cluster (LHA) and 124 observations. The analysis was repeated using a random-effects multilevel model with three levels of cluster (year, region and LHA), with similar results for the remaining covariates (hospitalization rate and total population).

The unit of analysis was the LHA.

Adjusting for year, total LHA population and region, all composite PQIs were significantly and positively associated with the rate of all admissions excluding ACSCs (table 2). In specific, the global hospitalization rate for ACSCs (PQI 90) increased by 0.27 admissions × 100,000 inhabitants every 10 general hospitalizations more, suggesting that the two rates are correlated but PQIs are also appraising another construct in addition to health care use.

With purely descriptive purposes, the rates of all individual PQIs of each of the 44 included LHAs and each of the 11 included health districts, in each year, have been reported in the Supplementary tables S4 and S5, respectively.

## Discussion

With this reanalysis of >11 million hospital admissions in 3 years, we evaluated whether PQIs might be used among the measures to compare the health care quality of local-level providers within a European country characterized by universal coverage such as Italy, in which primary health care management is in charge of LHAs and health districts. The results of the present study support the use of the indicators proposed by AHRQ: composite PQIs showed a good discriminative ability among LHAs and among districts, a high level of stability during the triennium, and although they were significantly correlated with the overall admission rates, there was evidence that the rates of preventable hospitalization are not simply a reflection of the general hospitalization rates. Interestingly, while the admission rates for preventable conditions declined by 2.4% during the study period (−7.4% among chronic conditions and +12.2% among acute conditions), the rates for non-preventable conditions (all the others<sup>41</sup>) declined by 7.3%, which does not seem to indicate an impact on primary health care—at least in the short-term and especially for acute conditions—of the

concomitant in-depth Italian health care system restructuring<sup>42</sup> (which were only recently focused on primary care organization<sup>43</sup>).

PQIs have already been validated to assess primary health care quality in several studies carried out in the USA<sup>19–29,44</sup> and other countries,<sup>45</sup> including Italy.<sup>32–35</sup> The comparisons, however, were carried out mostly at a national<sup>19–25,44</sup> or regional level<sup>34,35</sup> or to identify potential predictors of poorer access to primary health care.<sup>26–28,32,33</sup> Some technical AHRQ reports reported data at a county level, but no attempt at assessing the validity of PQIs was made.<sup>30,31</sup> In Italy, an agency of the Minister of Health (Age.Na.s) computed PQIs for each province, but LHAs do not always correspond to provinces, and data are not publicly available.<sup>46</sup> In fact, to date, only one study assessed whether PQIs were appropriate to compare small geographical areas, particularly counties from Kentucky in the years 2006–08.<sup>29</sup> The results of such analysis were in line with our findings: PQIs showed significant and clinically important variations across counties, but each indicator had stable rates over time within a county. The authors concluded that PQIs are potentially suitable for the implementation of a structured system for primary health care quality assessment. Having the chance to compare the performance of small territorial entities might be crucial to establish a meaningful (and acceptable) system for the evaluation of the quality of primary care. In several countries including Italy, the organizational (and often even the strategic) management of primary care services is not set only at a regional level, and most responsibility is given to local health care providers. Thus, the detection of poor performances and the development of interventions aimed at improving the quality of primary care should necessarily involve also local-level providers.

The construct validity of PQIs can be reasonably assumed: besides AHRQ,<sup>17</sup> the relationship between ACSCs and other primary health care quality was also supported by a recent systematic review

including 51 studies, in which the authors concluded that ‘most studies confirmed the expected relationship between indicators of primary health care and hospitalization for ACSCs, showing lower hospitalization rates for ACSCs in areas with greater access to primary health care’.<sup>47</sup> If further research will confirm PQIs face and predictive validity, the next step might be the addition of PQIs to enhance the content validity of the sets of indicators that are currently used to assess the performance of primary care practices.<sup>48,49</sup>

The major strengths of our analysis include the relatively large data set, the inclusion of several regions throughout Italy, the use of a 3-year time span and the adoption of exactly the same AHRQ criteria for the computation of PQIs (thus increasing comparability). However, this study has some limitations that must be considered in interpreting the results. First, as most studies on PQIs, we did not consider several factors that are beyond the control of family physicians (such as disease prevalence, income level, health care access), and that may explain part of the differences in potentially avoidable admission rates existing between small areas.<sup>14</sup> Notably, however, access to care in Italian NHS is granted for all with limited or no additional expense. Also, unfortunately in Italy most of the epidemiological estimates are based on hospital discharge abstracts; thus, it would have been of limited utility to adjust comparisons of hospitalization rates using other (likely related) hospitalization rates. A second limitation derives from our ability to compute PQI admission rates for a small proportion of health districts only, since data were retrieved from 3 LHAs out of 44 involved in the study (because of privacy barriers and data collection inefficiencies). Thus, further studies including a higher number of health districts are strongly recommended and caution is required to interpret the findings on health districts. Third, the coding of admissions abstract could differ among LHA units and this may induce some bias.<sup>50,51</sup> Fourth, it must be acknowledged that substantive structural differences exist between Italian and the US health care systems,<sup>36</sup> and the US PQI rates have been shown for merely descriptive purposes: a structured comparison between the countries would require extra data and analyses. Finally, we only assessed the relatively few diseases that were included in PQIs, and it will certainly be useful in the future to add some conditions to the analysis, especially those that have been examined and validated in previous studies on the Italian setting.<sup>51,52</sup>

Italy, as well as several other countries, still misses a structured system to evaluate primary health care quality. For these quality assessment systems, it is crucial to achieve a high level of precision, to discriminate the performance of the entities that are responsible for the performance itself, and to align hospitalization rate indicators with measures of other contexts of care (cost, clinical management, satisfaction/experience<sup>48</sup>) that are typically computed at a local level. The results of the present study support the use of composite PQIs, in nations with universal health care coverage, as a valid set of indicators to evaluate the quality of relatively small primary health care providers (up to ~50 000 enrollees).

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*Conflicts of interest:* None declared.

## Key points

- Outside the USA, AHRQ Prevention Quality Indicators (PQIs) have never been used to compare the quality of primary care services at a local level; however, in several national health systems, primary care is not directly

managed by the regions, but is in charge of smaller territorial entities.

- For a primary care quality assessment system, it is crucial to achieve a high level of precision, to discriminate the performance of the entities that are responsible for the performance itself, and to align hospitalization rate indicators with measures of other contexts of care (cost, clinical management, satisfaction/experience) that are typically computed at a local level.
- Composite PQIs were able to differentiate local-level providers such as Italian local health authorities or health districts, which showed small variation in the performance ranking across the years, as it might be expected given that time is needed to observe the effects of changes on health services.
- In nations with universal health care coverage, composite PQIs appeared a valid set of indicators to evaluate the performance of relatively small primary health care providers.

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**Online supplemental Table S1.** Selected characteristics of the study population, years 2008-2010.

	<b>Residents ≥18 years</b>	<b>Females, %</b>	<b>Residents &gt;65 years, %</b>	<b>Total number of hospitalizations</b>	<b>Hospitalizations for ACSC (PQI)<sup>a</sup>, % (n)</b>
<i>Overall sample</i>					
2008	17,616,585	52.0	23.3	4,126,021	5.5 (227,244)
2009	17,796,910	52.0	23.3	3,466,071	5.7 (198,400) <sup>b</sup>
2010	17,948,066	52.0	23.5	3,878,630	5.7 (222,536)
<i>Abruzzo</i>					
2008	1,109,754	52.0	24.5	285,315	5.8 (16,440)
2009	1,120,418	52.0	24.1	267,426	6.0 (16,106)
2010	1,125,624	52.0	25.3	259,195	5.7 (14,864)
<i>Emilia-Romagna</i>					
2008	3,625,553	52.0	25.4	783,062	6.4 (50,037)
2009	3,669,816	52.0	25.3	802,304	6.3 (50,823)
2010	3,711,034	52.0	25.3	780,129	6.4 (49,981)
<i>Lazio</i>					
2008	4,626,251	52.6	22.3	1,202,044	4.9 (58,394)
2009	4,679,760	52.6	22.4	560,684 <sup>b</sup>	5.2 (29,379) <sup>b</sup>
2010	4,727,710	52.6	22.4	1,127,440	4.9 (55,533)
<i>Lombardy</i>					
2008	8,050,078	51.7	22.5	1,815,207	5.4 (98,437)
2009	8,122,423	51.6	22.7	1,795,827	5.5 (98,286)
2010	8,179,306	51.7	22.8	1,672,560	5.9 (98,582)
<i>Trieste (city)</i>					
2008	204,949	53.6	30.4	40,393	9.7 (3,936)
2009	204,493	53.6	30.7	39,830	9.6 (3,806)
2010	204,392	53.6	30.8	39,306	9.1 (3,576)

<sup>a</sup> ACSC = Ambulatory Care Sensitive Conditions according to the Prevention Quality Indicators Criteria: all the admissions that have been assigned to one of the 13 individual Prevention Quality Indicators. <sup>b</sup> Data of the Local Health Units 101-105 of the Lazio Region (City of Rome), for the year 2009, were not available.

**Online supplemental Table S2.** Prevention Quality Indicators 90-91-92: hospital admission rates in four Italian regions and one Local Health Unit (Trieste), 2008-2010.

Indicators (admission rates x 100.000)	Abruzzo			Δ %	Emilia-Romagna			Δ %	Lazio			Δ %	Lombardy			Δ %	Trieste			Δ %
	2008	2009	2010	08-10	2008	2009	2010	08-10	2008	2009	2010	08-10	2008	2009	2010	08-10	2009	2009	2010	08-10
PQI 90 - Overall PQI composite	1260	1193	1144	-9.2	1121	1049	1108	-1.2	963	866	962	-0.1	971	865	954	-1.8	1237	1142	1113	-10.0
PQI 91 - Acute PQI composite	283	293	305	+7.8	342	381	384	+12.3	219	226	253	+15.5	241	254	267	+10.8	437	465	454	+3.9
PQI 92 - Chronic PQI composite	988	898	839	-15.1	785	682	751	-4.3	740	635	700	-5.4	735	629	684	-6.9	790	728	660	-16.5



**Online supplemental Table S3.** Stability over time (from 2008 to 2010) in the performance ranking of the Local Health Authorities or health districts, based on the composite Prevention Quality Indicators (PQIs 90-92).

	% of LHAs with small ranking variation <sup>a</sup>	% of health districts with small ranking variation <sup>b</sup>
PQI-90 (Overall)	69.8	100.0
PQI-91 (Acute)	76.7	83.8
PQI-92 (Chronic)	76.7	100.0

<sup>a</sup> A variation in the LHAs ranking was considered small (or “physiological”) if, during the triennium 2008-2010, the rank of a LHA did not vary of more than 8 positions (if, for example, a LHA ranked tenth in 2008, and it was not ranked lower than 18<sup>th</sup> or higher than 2<sup>nd</sup> in 2009 and 2010).

<sup>b</sup> A variation in the health district ranking was considered small (or “physiological”) if, during the triennium 2008-2010, the rank of a district did not vary of more than 3 positions (if, for example, a district ranked sixth in 2008, and it was not ranked lower than 9<sup>th</sup> or higher than 3<sup>rd</sup> in 2009 and 2010).

**Online Supplemental Table S4.** Individual Prevention Quality Indicators (PQI): overall hospitalization rates for ambulatory care sensitive conditions in 44 Local Health Authorities from five Italian regions (Abruzzo: 130; Emilia-Romagna: 80; Lazio: 120; Lombardy 30; Trieste: 60); years 2008-2010.

Region	Local Health Authority	Total Pop.	Total Pop. >=18y	Total Pop. >=40y	Total Pop. 18-39y	Total n. of admissions			Hospitalization rate (x1000)			PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	PQI 16	
						2008	2009	2010	2008	2009	2010														
Year		2009*	2009*	2009*	2009*	2008	2009	2010	2008	2009	2010	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
130	201	301960	260473	170853	84000	67978	63148	59772	225	209	198	15	37	48	320	137	593	46	197	63	170	27	83	7	
130	202	387048	333870	218997	107670	80358	76472	74049	208	198	191	16	18	42	391	111	556	35	193	71	119	31	240	10	
130	203	314985	271708	178223	87624	72233	68435	66379	229	217	211	9	22	68	414	95	444	35	187	77	113	37	259	9	
130	204	304318	262506	172187	84656	64746	59371	58995	213	195	194	26	20	45	330	81	366	12	145	62	146	38	172	10	
80	101	282845	244732	165747	74728	47121	56826	47871	167	201	169	20	29	112	246	34	336	32	180	87	90	37	33	7	
80	102	431397	373267	252798	113977	77626	82395	77894	180	191	181	21	34	43	288	28	420	14	153	62	95	32	86	10	
80	103	517481	447751	303243	136720	89589	92943	90331	173	180	175	24	27	39	184	41	427	41	153	67	161	19	64	6	
80	104	683914	591758	400773	180692	119389	119900	118259	175	175	173	19	35	41	258	27	418	27	168	81	148	32	84	9	
80	105	839084	726019	491702	221689	158890	160151	156347	189	191	186	25	34	61	387	56	449	42	276	106	131	36	51	10	
80	106	128783	111430	75467	34025	22973	23351	23527	178	181	183	16	23	38	260	18	432	38	348	115	121	24	44	18	
80	109	351263	303931	205840	92805	71588	70460	69685	204	201	198	17	23	43	245	61	568	67	274	135	124	32	42	6	
80	110	382940	331339	224402	101174	72531	73421	71942	189	192	188	13	58	70	358	29	565	43	257	109	85	41	35	5	
80	111	183149	158470	107325	48388	34245	33359	32466	187	182	177	13	27	93	324	33	278	59	288	40	68	18	81	9	
80	112	202749	175429	118810	53567	36333	36409	35709	179	180	176	6	28	64	307	42	520	26	277	50	125	50	190	6	
80	113	321316	278019	188290	84893	52777	53089	56298	164	165	175	8	38	61	306	32	349	21	190	61	97	20	24	8	
30	301	1087878	914594	605785	290748	186198	184047	170332	174	172	160	10	31	78	174	19	315	20	171	38	90	109	66	8	
30	302	1121588	960595	636254	305372	228429	227325	210479	204	203	188	7	34	76	303	48	371	22	207	74	111	31	91	7	
30	303	578275	496270	328044	157446	104251	103283	94487	180	179	163	10	32	183	275	23	272	22	175	37	98	205	147	6	
30	304	353393	302667	200473	96217	69634	68620	65089	197	194	184	6	22	57	211	24	470	22	121	44	132	48	63	11	
30	305	330612	283156	187550	90015	57039	57492	53881	173	174	163	9	29	110	306	26	372	17	153	45	134	37	104	13	
30	306	228519	195717	129634	62218	45898	45089	40845	201	197	179	9	16	63	224	27	425	35	186	45	79	75	132	7	
30	307	403773	345815	229052	109934	76555	75287	72250	190	186	179	10	38	54	275	33	541	28	171	60	147	32	59	12	
30	308	1548643	1326350	878514	421645	311839	306863	280638	201	198	181	9	33	72	371	26	381	26	212	61	124	58	134	8	
30	309	913552	782420	518239	248730	162562	160307	146970	178	175	161	12	33	62	275	20	336	20	164	58	110	35	138	6	
30	310	623791	534252	353864	169838	109337	109498	102666	175	176	165	6	23	73	228	12	277	15	154	41	100	44	134	9	
30	311	800553	685641	454137	217964	139448	139277	131559	174	174	164	8	34	84	380	15	269	18	155	44	67	32	170	6	
30	312	532906	456412	302307	145093	117045	115037	109388	220	216	205	15	27	85	310	34	379	25	205	58	118	52	76	9	
30	313	178024	152470	100989	48470	33778	32746	31239	190	184	175	8	31	41	237	33	346	39	247	64	132	51	89	9	
30	314	858475	735249	498995	233735	153918	151752	145188	179	177	169	12	30	82	271	36	320	20	166	46	110	57	101	9	
30	315	99156	84923	56249	26997	19276	19224	17549	194	194	177	8	22	75	276	42	424	24	246	55	102	51	115	1	
120	101	482790	413372	270520	134821	123673		108929	256		221	12	30	152	254	149	348	27	191	50	135	80	205	6	
120	102	669810	573502	375312	187047	143982		139921	215		209	7	27	87	192	77	294	31	137	39	102	54	325	4	
120	103	536184	459089	300437	149732	112224		109429	209		204	9	30	71	235	80	319	36	151	29	105	56	246	4	
120	104	551497	472200	309018	154008	118582		110069	215		200	7	25	82	235	77	247	9	118	28	79	48	309	7	
120	105	512304	438643	287057	143063	128005		118425	250		231	8	26	94	322	120	338	27	199	53	114	56	317	4	
120	106	309911	265350	173651	86544	67751		66216	219		209	8	22	98	211	139	279	18	127	48	96	54	344	9	
120	107	475293	408954	268319	132728	92946		87937	196		185	9	29	102	221	83	332	23	117	36	92	51	317	7	
120	108	538004	460647	301457	150240	110891		109357	206		196	7	31	94	269	104	268	16	151	52	103	66	369	5	
120	109	311262	266507	174408	86921	62583		61162	201		187	11	23	86	107	44	410	28	125	62	110	30	136	7	
120	110	155942	133520	87378	43547	34199		34355	34345		220	10	22	132	336	154	605	52	186	67	158	132	156	7	
120	111	540021	462374	302588	150803	106997		103022	198		183	30	21	83	311	127	363	12	125	62	170	46	221	7	
120	112	484118	414510	271264	135192	100211		96257	207		192	24	16	38	222	130	347	5	119	61	97	24	201	6	
60	101	236457	204949	151683	53266	40393		39830	39306		166	16	33	54	470	61	597	131	361	94	201	31	17	4	

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Online Supplemental Table S4. (continued)

Region	Local Health Authority	PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	PQI 16	PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	PQI 16
		2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
130	201	15	39	41	317	153	557	34	221	63	139	26	86	8	10	25	35	150	68	575	56	200	44	148	22	63	7
130	202	7	16	41	314	103	565	33	235	62	121	25	254	10	10	14	26	110	98	611	46	225	64	126	21	211	9
130	203	10	21	59	367	82	491	35	241	68	120	34	243	8	10	23	37	251	64	540	40	239	75	129	29	211	9
130	204	26	17	38	281	63	397	9	140	62	140	27	110	9	25	17	35	226	58	427	12	149	59	115	23	110	9
80	101	15	38	127	305	42	373	34	216	95	113	42	13	11	16	43	129	245	27	357	34	179	78	86	34	28	6
80	102	20	31	46	230	55	484	28	179	75	88	30	77	12	20	36	51	172	35	488	29	165	77	73	29	81	9
80	103	21	33	58	161	38	388	32	154	73	167	26	53	7	20	42	50	151	34	394	39	159	85	149	21	78	7
80	104	17	33	54	240	34	403	34	191	93	151	29	45	8	18	31	46	210	29	424	29	207	102	127	32	64	6
80	105	22	33	59	330	53	457	32	316	119	121	29	38	11	25	28	71	299	41	473	40	292	119	122	31	45	11
80	106	28	20	20	264	14	401	25	377	136	118	27	71	9	18	23	30	215	12	385	30	382	129	80	30	41	19
80	109	13	29	37	237	52	595	66	296	147	107	30	40	10	9	36	39	193	35	591	59	292	163	103	22	30	13
80	110	14	55	58	347	52	569	52	295	116	64	48	36	7	12	47	79	313	57	543	48	298	127	60	43	40	8
80	111	10	31	106	274	27	263	49	275	57	76	15	45	9	16	34	86	276	33	290	90	246	52	60	18	48	5
80	112	12	25	55	315	41	464	32	334	59	123	25	114	7	8	25	42	315	40	491	39	324	68	104	32	88	6
80	113	9	42	45	290	28	366	29	232	66	98	35	27	12	10	41	42	283	37	431	28	256	78	107	26	24	8
30	301	8	30	69	194	17	303	19	185	39	85	104	51	7	8	33	57	194	22	316	18	188	40	76	80	51	6
30	302	10	32	70	298	32	389	21	230	82	110	28	80	7	9	30	63	310	39	446	20	237	79	103	35	89	6
30	303	9	32	20	295	20	271	20	198	40	96	191	114	9	8	31	211	263	23	297	17	197	33	91	149	111	10
30	304	8	34	53	201	15	458	16	124	46	136	30	46	12	6	34	41	303	19	493	15	149	55	140	29	46	5
30	305	9	27	125	310	22	348	13	163	51	149	37	80	13	8	28	121	309	24	358	19	167	51	121	31	87	7
30	306	9	18	64	248	19	371	27	216	42	104	65	80	8	8	24	45	225	20	375	24	216	38	66	49	63	9
30	307	8	41	60	239	29	533	31	187	62	143	33	63	6	7	41	61	210	29	541	41	176	62	125	28	63	9
30	308	8	33	68	367	26	393	30	256	78	119	57	111	8	7	42	66	345	21	416	24	241	73	116	55	124	10
30	309	7	32	59	256	15	304	21	183	55	113	30	118	7	9	37	62	245	14	326	21	194	53	93	34	103	7
30	310	8	24	67	262	14	280	19	182	52	97	37	108	9	6	24	62	262	10	289	17	180	46	85	47	123	9
30	311	8	32	101	331	13	277	17	186	48	72	27	123	6	8	36	98	280	15	299	20	183	60	68	20	138	8
30	312	11	21	87	291	32	428	21	256	70	134	41	63	10	13	22	94	270	31	485	19	266	71	120	43	88	9
30	313	11	31	37	209	26	324	53	208	61	99	31	60	7	10	35	37	202	35	277	41	192	46	93	23	62	4
30	314	10	32	67	287	31	315	19	187	57	109	46	82	8	8	28	45	270	28	333	22	192	61	104	50	77	6
30	315	6	18	72	288	33	334	14	272	47	92	55	96	1	9	27	88	228	32	365	16	248	69	80	57	100	5
120	101														8	35	149	213	105	322	35	208	51	104	90	182	6
120	102														5	30	74	125	77	295	34	159	39	94	54	315	5
120	103														9	33	64	126	67	395	39	160	33	111	60	190	6
120	104														4	32	72	117	50	286	17	130	30	90	42	232	5
120	105														7	30	66	248	96	378	23	210	51	89	54	282	5
120	106	6	25	70	188	144	301	14	147	46	91	53	336	8	6	20	70	157	158	352	14	156	50	84	50	328	6
120	107	9	22	93	196	54	336	19	137	33	81	55	275	6	9	29	97	132	58	361	21	132	31	72	46	254	5
120	108	7	41	89	261	89	317	14	172	50	95	76	292	7	6	40	83	158	78	315	16	176	42	86	64	305	3
120	109	8	27	75	139	45	438	32	135	62	90	29	130	6	7	29	68	142	57	466	30	158	61	87	26	175	5
120	110	6	25	101	272	146	511	46	196	75	111	123	147	8	4	23	128	244	153	528	43	193	75	118	158	168	7
120	111	26	20	82	225	110	377	14	157	66	165	34	177	5	8	25	58	155	84	425	15	168	53	186	35	162	3
120	112	20	17	45	239	112	389	9	150	56	93	43	234	6	18	16	32	192	124	372	12	159	55	95	30	278	5
60	101	18	30	41	411	60	564	110	414	100	190	28	17	5	12	27	28	355	36	550	111	377	121	196	21	20	7

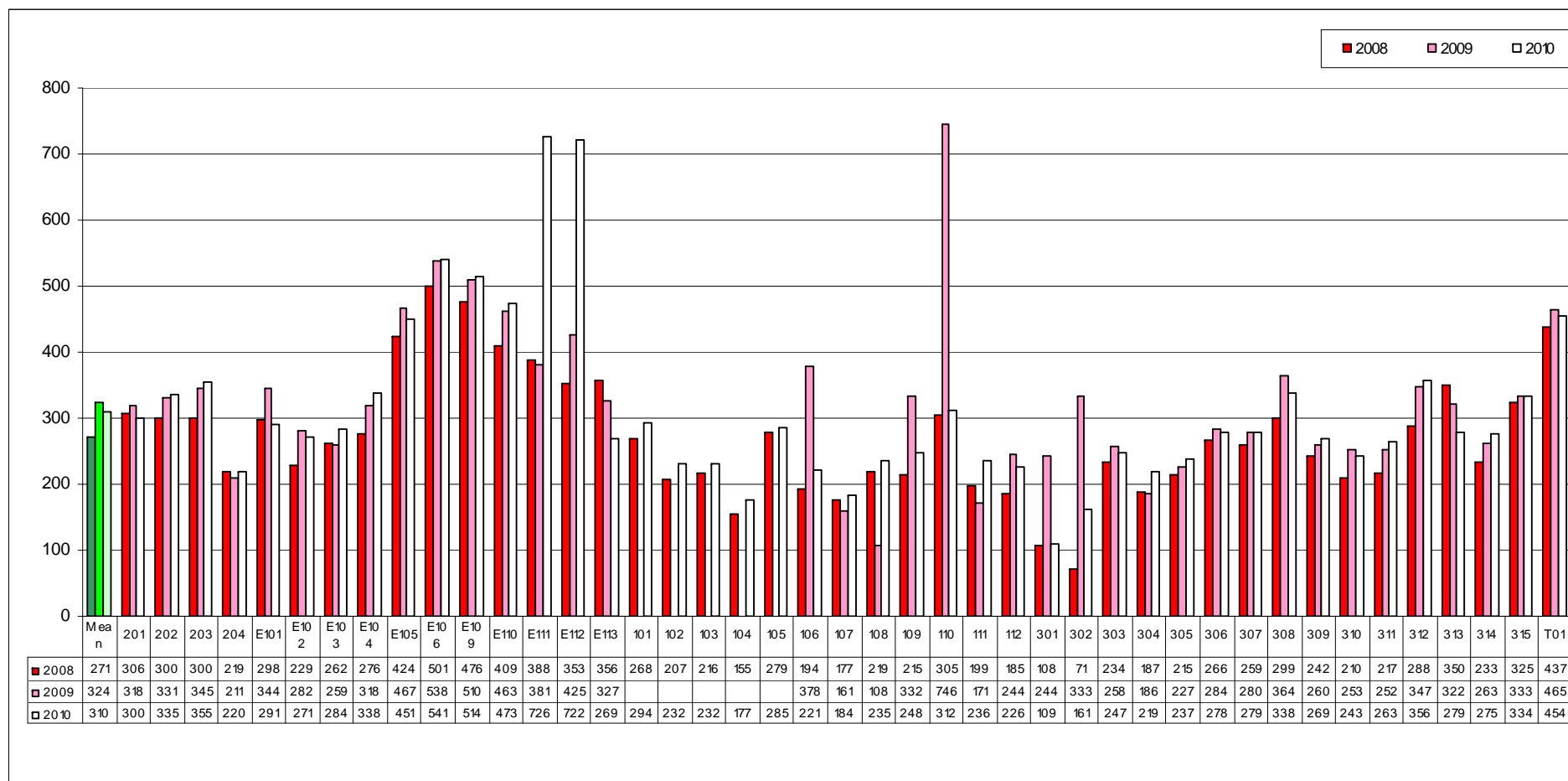
\* The variation in the total population (pop.) was very small: only the 2009 population was shown to avoid redundancy. Data of the Local Health Units 101-105 of the Lazio Region (City of Rome), for the year 2009, were not available.

**Online Supplemental Table S5.** Individual Prevention Quality Indicators (PQI): overall hospitalization rates for ambulatory care sensitive conditions in 11 health districts from three Local Health Authorities (LHA of Pescara - Pe01-Pe06; LHA of Lanciano-Vasto-Chieti - district of Francavilla; LHA of Trieste - Tr01-Tr04); years 2008-2010.

Local Health Authority	Health District	Total Pop.	Total Pop. >=18y	Total Pop. >=40y	Total Pop. 18-39y	Total n. of admissions			Hospitalization rate (x1000)			PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	PQI 16		
						2008	2009	2010	2008	2009	2010															
Year		2009*	2009*	2009*	2009*	2008	2009	2010	2008	2009	2010	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008		
203	1	88374	58050	40067	17982	16798	17465	16544	246	255	242	5	26	53	359	88	365	26	145	71	98	34	323	2		
203	2	54688	46430	32047	14383	13635	13291	12745	249	243	233	6	26	82	471	101	498	15	200	82	155	24	160	6		
203	3	57852	48687	29562	17124	12409	11661	11481	214	202	198	11	22	101	409	86	390	24	199	69	96	39	204	6		
203	4	43879	36551	23958	12637	9907	9005	8395	226	205	191	22	10	66	346	115	512	16	148	85	74	66	380	22		
203	5	54309	44316	28023	16293	11576	11079	10667	213	204	196	7	27	65	414	77	334	11	181	74	140	50	166	11		
203	6	37983	31450	20663	10787	9435	8931	8733	248	235	230	6	22	54	595	143	824	175	343	118	153	22	306	16		
202	9	86602	54813	34899	19914	14409	13652	13102	216	205	197	29	20	35	398	115	504	24	162	49	108	38	336	4		
T1	101	86666	57756	44698	13043	9803	9499	9700	147	142	146	16	36	38	347	47	506	90	275	59	159	35	0	5		
T2	102	80520	53559	40952	12598	9742	9853	9396	161	163	155	11	29	58	474	73	569	144	386	105	168	30	32	2		
T3	103	85883	58053	45503	12540	10561	10303	10274	160	156	156	12	39	55	426	52	537	103	293	105	200	21	32	7		
T4	104	61823	54243	41656	12580	10174	10088	9844	165	163	159	17	28	48	406	52	577	146	367	77	206	29	8	0		
Health District	PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	PQI 16	PQI 1	PQI 2	PQI 3	PQI 5	PQI 7	PQI 8	PQI 10	PQI 11	PQI 12	PQI 13	PQI 14	PQI 15	
Year	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
1	17	30	21	245	76	386	9	236	57	124	33	284	7	14	40	36	190	53	424	10	188	72	114	38	272	
2	11	29	56	431	86	506	15	282	95	129	30	153	6	4	25	39	371	60	582	17	314	134	166	30	132	
3	4	15	109	369	64	396	21	199	64	103	26	280	4	15	19	41	254	60	435	28	240	32	118	19	216	
4	8	17	41	280	156	462	44	230	90	71	88	222	8	11	22	44	175	115	520	55	216	77	131	52	174	
5	9	23	63	385	74	415	7	244	45	131	18	215	16	7	38	11	207	50	514	11	201	61	135	20	166	
6	13	16	95	649	70	1107	172	331	86	207	29	250	6	10	7	73	377	83	1091	181	382	121	153	19	315	
9	7	17	49	347	139	564	35	203	73	91	35	357	2	9	12	36	112	100	679	64	208	53	120	27	221	
101	14	37	43	307	59	474	80	308	76	159	36	8	7	5	32	17	260	19	485	87	298	102	178	10	31	
102	17	31	45	452	56	521	129	495	114	189	26	32	2	17	29	35	357	35	467	133	398	95	202	26	24	
103	12	32	24	314	41	518	78	334	79	193	21	24	5	9	35	33	308	40	487	81	329	112	169	26	16	
104	22	19	39	389	63	546	120	383	96	155	20	8	6	15	14	18	341	37	572	105	354	131	168	13	8	

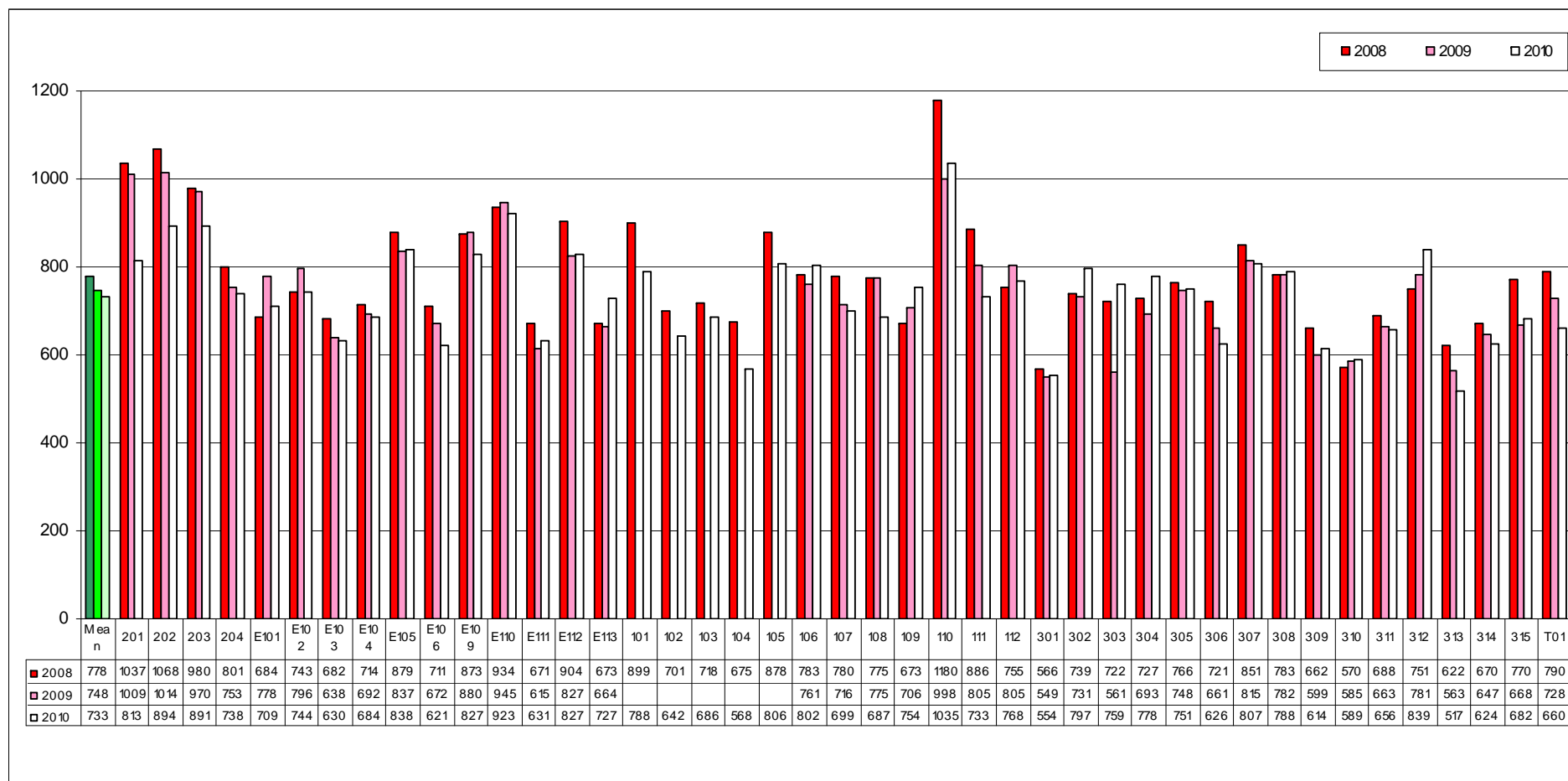
\* The variation in the total population (pop.) was very small: only the 2009 population was shown to avoid redundancy.

**Online Supplemental Figure S1.** Prevention Quality Indicators: PQI 91 – Overall hospitalization rates for *acute* ambulatory care sensitive conditions in 44 Local Health Authorities from five Italian regions (Abruzzo: LHAs 201-204; Emilia-Romagna: E101-E113; Lazio: 101-112; Lombardy: 301-315; Trieste: T01); years 2008-2010.



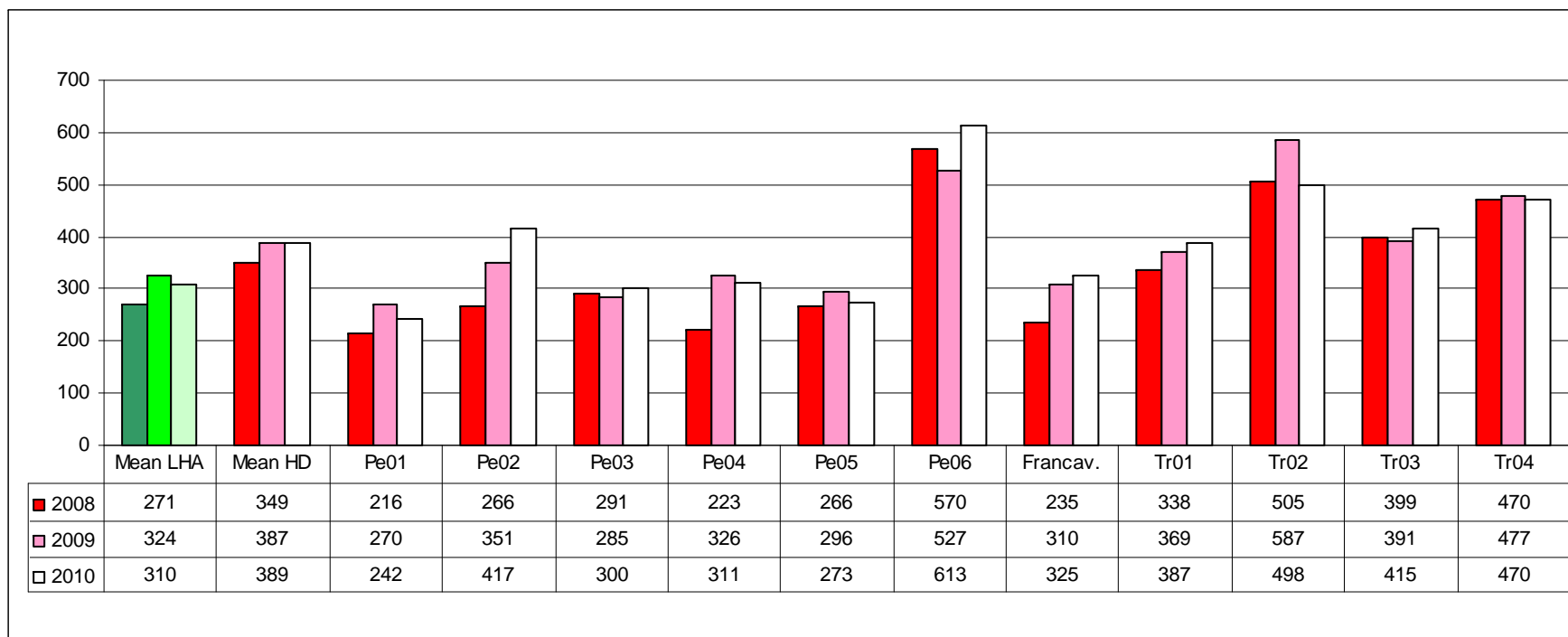
\* Data of the Local Health Units 101-105 of the Lazio Region (City of Rome), for the year 2009, were not available.

**Online Supplemental Figure S2.** Prevention Quality Indicators: PQI 92 – Overall hospitalization rates for *chronic* ambulatory care sensitive conditions in 44 Local Health Authorities from five Italian regions (Abruzzo: LHAs 201-204; Emilia-Romagna: E101-E113; Lazio: 101-112; Lombardy: 301-315; Trieste: T01); years 2008-2010.

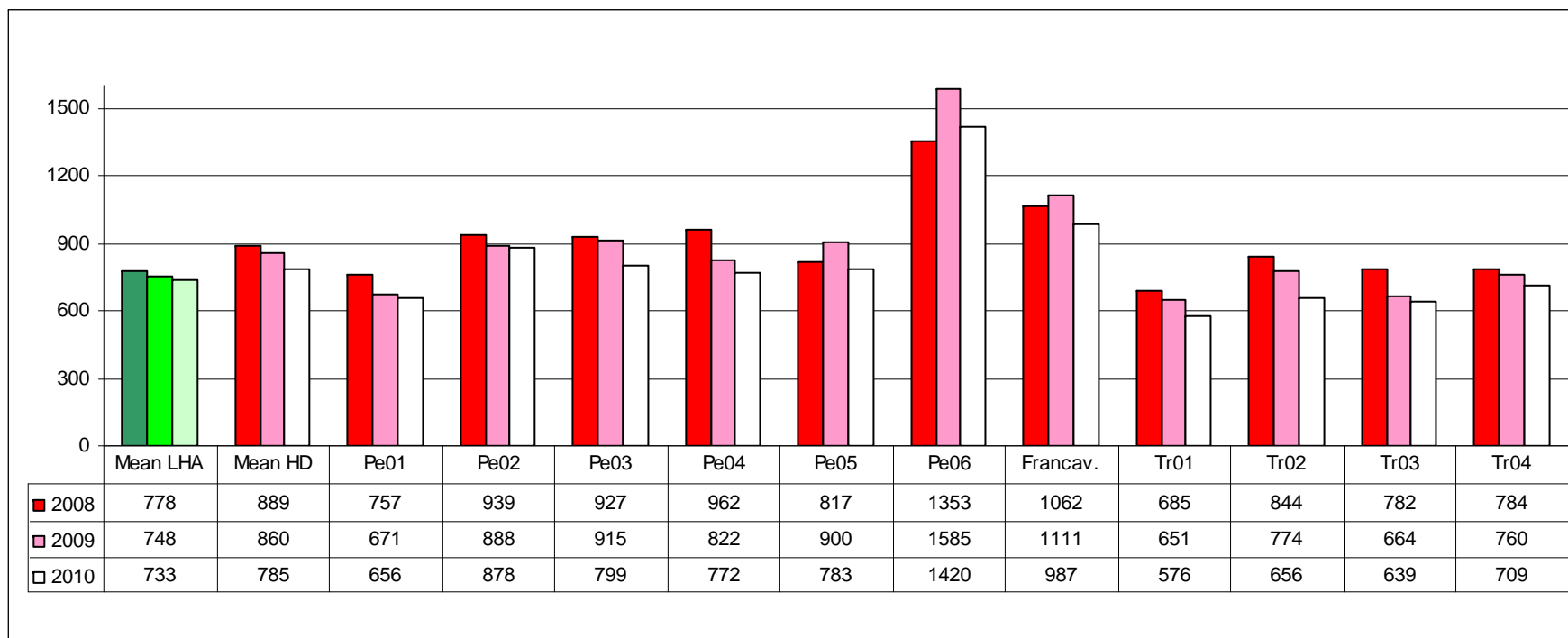


\* Data of the Local Health Units 101-105 of the Lazio Region (City of Rome), for the year 2009, were not available.

**Online Supplemental Figure S3.** Prevention Quality Indicators: PQI 91 - Overall hospitalization rates for *acute* ambulatory care sensitive conditions in 11 health districts from three Italian Local Health Authorities (LHA of Pescara - Pe01-Pe06; LHA of Lanciano-Vasto-Chieti - district of Francavilla; LHA of Trieste - Tr01-Tr04); years 2008-2010.



**Online Supplemental Figure S4.** Prevention Quality Indicators: PQI 92 - Overall hospitalization rates for *chronic* ambulatory care sensitive conditions in 11 health districts from three Italian Local Health Authorities (LHA of Pescara - Pe01-Pe06; LHA of Lanciano-Vasto-Chieti - district of Francavilla; LHA of Trieste - Tr01-Tr04); years 2008-2010.





**Technical specifications for the computation of the Prevention Quality Indicators (PQI), according to the original criteria established by the Agency for Healthcare Research and Quality (AHRQ). The following analysis were carried out using Stata statistical software, version 11.1 (Stata Corp., College Station, TX, USA, 2009).**

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### Preliminary specifications

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1. Active mobility must be dropped from the file.
2. aslresnew identifies the Local Health Authority, and must be checked and eventually recomputed using Istat (Italian Institute of Statistics) city file.
2. The following variable names should be checked and eventually renamed:
  - age (numerical)
  - sex (num.)
  - drg (num.)
  - provenienza stands for provenance (string)
  - diagpri, diagn1, diagn2, diagn3, diagn4, diagn5 identify of the principal and secondary diagnosis fields (all strings)
  - intpri, intsel1, intse2, intse3, intse4, intse5 identify of the principal and secondary intervention fields (all strings)

```
gen agecat=recode(age,9.99,17.99,29.99,39.99,49.99,59.99,69.99,79.99,140)
```

---

### PQI 1 - Diabetes short-term complications

---

```
gen pqildiabshort=1 if  
diagpri=="25010"|diagpri=="25011"|diagpri=="25012"|diagpri=="25013"|diagpri=="25  
020"|diagpri=="25021"|diagpri=="25022"|diagpri=="25023"|diagpri=="25030"|diagpri  
=="25031"|diagpri=="25032"|diagpri=="25033"
```

```
replace pqildiabshort=0 if pqildiabshort==.
```

```
replace pqildiabshort=. if age<18
```

```
replace pqildiabshort=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
```

```
replace pqildiabshort=. if drg>=370&drg<=384
```

```
replace pqildiabshort=. if age==.|sex==.
```

## PQI 2 - Perforated Appendix

---

```
gen pqi2append=1 if
diagpri=="5400" |diagn1=="5400" |diagn2=="5400" |diagn3=="5400" |diagn4=="5400" |diag
n5=="5400"

replace pqi2append=1 if
diagpri=="5401" |diagn1=="5401" |diagn2=="5401" |diagn3=="5401" |diagn4=="5401" |diag
n5=="5401"

replace pqi2append=0 if
diagpri=="5409" |diagn1=="5409" |diagn2=="5409" |diagn3=="5409" |diagn4=="5409" |diag
n5=="5409"

replace pqi2append=0 if
diagpri=="541" |diagn1=="541" |diagn2=="541" |diagn3=="541" |diagn4=="541" |diagn5=="
541"

replace pqi2append=. if provenienza=="4" |provenienza=="5" |provenienza=="6"

replace pqi2append=. if drg>=370&drg<=384

replace pqi2append=. if age==. |sex==.
```

### PQI 3 - Diabetes long-term complications

---

```
gen pqi3diablong=1 if diagpri>="25040"&diagpri<="25093"  
replace pqi3diablong=0 if pqi3diablong==.  
tab pqi3diablong  
replace pqi3diablong=. if age<18  
tab pqi3diablong  
replace pqi3diablong=. if provenienza=="4"|provenienza=="5"|provenienza=="6"  
replace pqi3diablong=. if drg>=370&drg<=384  
replace pqi3diablong=. if sex==.|age==.
```

## PQI 5 - Chronic obstructive pulmonary disease or asthma in older adults

---

```
gen pqi5copd=1 if
diagpri=="4910" |diagpri=="4911" |diagpri=="49120" |diagpri=="49121" |diagpri=="4918
" |diagpri=="4919" |diagpri=="4920" |diagpri=="4928" |diagpri=="494" |diagpri=="4940"
|diagpri=="4941" |diagpri=="496" |diagpri=="49300" |diagpri=="49301" |diagpri=="4930
2" |diagpri=="49310" |diagpri=="49311" |diagpri=="49312" |diagpri=="49320" |diagpri=="
49321" |diagpri=="49322" |diagpri=="49382" |diagpri=="49390" |diagpri=="49391" |diag
pri=="49392"
```

```
gen tempcopd=1 if
diagn1=="4910" |diagn1=="4911" |diagn1=="49120" |diagn1=="49121" |diagn1=="4918" |dia
gn1=="4919" |diagn1=="4920" |diagn1=="4928" |diagn1=="494" |diagn1=="4940" |diagn1=="
4941" |diagn1=="496"
replace tempcopd=1 if
diagn2=="4910" |diagn2=="4911" |diagn2=="49120" |diagn2=="49121" |diagn2=="4918" |dia
gn2=="4919" |diagn2=="4920" |diagn2=="4928" |diagn2=="494" |diagn2=="4940" |diagn2=="
4941" |diagn2=="496"
replace tempcopd=1 if
diagn3=="4910" |diagn3=="4911" |diagn3=="49120" |diagn3=="49121" |diagn3=="4918" |dia
gn3=="4919" |diagn3=="4920" |diagn3=="4928" |diagn3=="494" |diagn3=="4940" |diagn3=="
4941" |diagn3=="496"
replace tempcopd=1 if
diagn4=="4910" |diagn4=="4911" |diagn4=="49120" |diagn4=="49121" |diagn4=="4918" |dia
gn4=="4919" |diagn4=="4920" |diagn4=="4928" |diagn4=="494" |diagn4=="4940" |diagn4=="
4941" |diagn4=="496"
replace tempcopd=1 if
diagn5=="4910" |diagn5=="4911" |diagn5=="49120" |diagn5=="49121" |diagn5=="4918" |dia
gn5=="4919" |diagn5=="4920" |diagn5=="4928" |diagn5=="494" |diagn5=="4940" |diagn5=="
4941" |diagn5=="496"
```

```
replace pqi5copd=1 if diagpri=="4660"&tempcopd==1
replace pqi5copd=1 if diagpri=="490"&tempcopd==1
drop tempcopd
```

```
replace pqi5copd=0 if pqi5copd==.
```

### **replace pqi5copd=. if age<40**

```
replace pqi5copd=. if provenienza=="4" |provenienza=="5" |provenienza=="6"
replace pqi5copd=. if drg>=370&drg<=384
replace pqi5copd=. if sex==. |age==.
```

## PQI 7 - Hypertension

---

```
gen pqi7hypert=1 if
diagpri=="4010" |diagpri=="4019" |diagpri=="40200" |diagpri=="40210" |diagpri=="4029
0" |diagpri=="40300" |diagpri=="40310" |diagpri=="40390" |diagpri=="40400" |diagpri=="
40410" |diagpri=="40490"

replace pqi7hypert=0 if pqi7hypert==.

gen kidney=1 if
diagpri=="40300" |diagpri=="40310" |diagpri=="40390" |diagpri=="40400" |diagpri=="40
410" |diagpri=="40490"
replace kidney=1 if
diagn1=="40300" |diagn1=="40310" |diagn1=="40390" |diagn1=="40400" |diagn1=="40410" |
diagn1=="40490"
replace kidney=1 if
diagn2=="40300" |diagn2=="40310" |diagn2=="40390" |diagn2=="40400" |diagn2=="40410" |
diagn2=="40490"
replace kidney=1 if
diagn3=="40300" |diagn3=="40310" |diagn3=="40390" |diagn3=="40400" |diagn3=="40410" |
diagn3=="40490"
replace kidney=1 if
diagn4=="40300" |diagn4=="40310" |diagn4=="40390" |diagn4=="40400" |diagn4=="40410" |
diagn4=="40490"
replace kidney=1 if
diagn5=="40300" |diagn5=="40310" |diagn5=="40390" |diagn5=="40400" |diagn5=="40410" |
diagn5=="40490"

gen dialysis=1 if
intpri=="3895" |intpri=="3927" |intpri=="3929" |intpri=="3942" |intpri=="3943" |intpr
i=="3993" |intpri=="3994"
replace dialysis=1 if
intsel=="3895" |intsel=="3927" |intsel=="3929" |intsel=="3942" |intsel=="3943" |intse
l=="3993" |intsel=="3994"
replace dialysis=1 if
intse2=="3895" |intse2=="3927" |intse2=="3929" |intse2=="3942" |intse2=="3943" |intse
2=="3993" |intse2=="3994"
replace dialysis=1 if
intse3=="3895" |intse3=="3927" |intse3=="3929" |intse3=="3942" |intse3=="3943" |intse
3=="3993" |intse3=="3994"
replace dialysis=1 if
intse4=="3895" |intse4=="3927" |intse4=="3929" |intse4=="3942" |intse4=="3943" |intse
4=="3993" |intse4=="3994"
replace dialysis=1 if
intse5=="3895" |intse5=="3927" |intse5=="3929" |intse5=="3942" |intse5=="3943" |intse
5=="3993" |intse5=="3994"

replace pqi7hypert=0 if kidney==1&dialysis==1

drop kidney dialysis

gen cardiac=1 if
intpri=="0050" |intpri=="0051" |intpri=="0052" |intpri=="0053" |intpri=="0054" |intpr
i=="0056" |intpri=="0057" |intpri=="0066" |intpri=="1751" |intpri=="1752" |intpri=="3
500" |intpri=="3501" |intpri=="3502" |intpri=="3503" |intpri=="3504" |intpri=="3510" |
intpri=="3511" |intpri=="3512" |intpri=="3513" |intpri=="3514" |intpri=="3520" |intpr
i=="3521" |intpri=="3522" |intpri=="3523" |intpri=="3524" |intpri=="3525" |intpri=="3
526" |intpri=="3527" |intpri=="3528" |intpri=="3531" |intpri=="3532" |intpri=="3533" |
intpri=="3534" |intpri=="3535" |intpri=="3539" |intpri=="3541" |intpri=="3542" |intpr
```



```
replace cardiac=1 if
intse2=="3594" |intse2=="3595" |intse2=="3596" |intse2=="3597" |intse2=="3598" |intse
2=="3599" |intse2=="3601" |intse2=="3602" |intse2=="3603" |intse2=="3604" |intse2=="3
605" |intse2=="3606" |intse2=="3607" |intse2=="3609" |intse2=="3610" |intse2=="3611" |
intse2=="3612" |intse2=="3613" |intse2=="3614" |intse2=="3615" |intse2=="3616" |intse
2=="3617" |intse2=="3619" |intse2=="362" |intse2=="363" |intse2=="3631" |intse2=="363
2" |intse2=="3633" |intse2=="3634" |intse2=="3639" |intse2=="3691" |intse2=="3699" |in
tse2=="3731" |intse2=="3732" |intse2=="3733" |intse2=="3734" |intse2=="3735" |intse2=
"3736" |intse2=="3737" |intse2=="3741" |intse2=="375" |intse2=="3751" |intse2=="3752
" |intse2=="3753" |intse2=="3754" |intse2=="3755" |intse2=="3760" |intse2=="3761" |int
se2=="3762" |intse2=="3763" |intse2=="3764" |intse2=="3765" |intse2=="3766" |intse2==
"3770" |intse2=="3771" |intse2=="3772" |intse2=="3773" |intse2=="3774" |intse2=="3775
" |intse2=="3776" |intse2=="3777" |intse2=="3778" |intse2=="3779" |intse2=="3780" |int
se2=="3781" |intse2=="3782" |intse2=="3783" |intse2=="3785" |intse2=="3786" |intse2==
"3787" |intse2=="3789" |intse2=="3794" |intse2=="3795" |intse2=="3796" |intse2=="3797
" |intse2=="3798"
```

```
replace cardiac=1 if
intse3=="0050" |intse3=="0051" |intse3=="0052" |intse3=="0053" |intse3=="0054" |intse
3=="0056" |intse3=="0057" |intse3=="0066" |intse3=="1751" |intse3=="1752" |intse3=="3
500" |intse3=="3501" |intse3=="3502" |intse3=="3503" |intse3=="3504" |intse3=="3510" |
intse3=="3511" |intse3=="3512" |intse3=="3513" |intse3=="3514" |intse3=="3520" |intse
3=="3521" |intse3=="3522" |intse3=="3523" |intse3=="3524" |intse3=="3525" |intse3=="3
526" |intse3=="3527" |intse3=="3528" |intse3=="3531" |intse3=="3532" |intse3=="3533" |
intse3=="3534" |intse3=="3535" |intse3=="3539" |intse3=="3541" |intse3=="3542" |intse
3=="3550" |intse3=="3551" |intse3=="3552" |intse3=="3553" |intse3=="3554" |intse3=="3
555" |intse3=="3560" |intse3=="3561" |intse3=="3562" |intse3=="3563" |intse3=="3570" |
intse3=="3571" |intse3=="3572" |intse3=="3573" |intse3=="3581" |intse3=="3582" |intse
3=="3583" |intse3=="3584" |intse3=="3591" |intse3=="3592" |intse3=="3593"
```

```
replace cardiac=1 if
intse3=="3594" |intse3=="3595" |intse3=="3596" |intse3=="3597" |intse3=="3598" |intse
3=="3599" |intse3=="3601" |intse3=="3602" |intse3=="3603" |intse3=="3604" |intse3=="3
605" |intse3=="3606" |intse3=="3607" |intse3=="3609" |intse3=="3610" |intse3=="3611" |
intse3=="3612" |intse3=="3613" |intse3=="3614" |intse3=="3615" |intse3=="3616" |intse
3=="3617" |intse3=="3619" |intse3=="362" |intse3=="363" |intse3=="3631" |intse3=="363
2" |intse3=="3633" |intse3=="3634" |intse3=="3639" |intse3=="3691" |intse3=="3699" |in
tse3=="3731" |intse3=="3732" |intse3=="3733" |intse3=="3734" |intse3=="3735" |intse3=
"3736" |intse3=="3737" |intse3=="3741" |intse3=="375" |intse3=="3751" |intse3=="3752
" |intse3=="3753" |intse3=="3754" |intse3=="3755" |intse3=="3760" |intse3=="3761" |int
se3=="3762" |intse3=="3763" |intse3=="3764" |intse3=="3765" |intse3=="3766" |intse3==
"3770" |intse3=="3771" |intse3=="3772" |intse3=="3773" |intse3=="3774" |intse3=="3775
" |intse3=="3776" |intse3=="3777" |intse3=="3778" |intse3=="3779" |intse3=="3780" |int
se3=="3781" |intse3=="3782" |intse3=="3783" |intse3=="3785" |intse3=="3786" |intse3==
"3787" |intse3=="3789" |intse3=="3794" |intse3=="3795" |intse3=="3796" |intse3=="3797
" |intse3=="3798"
```

```
replace cardiac=1 if
intse4=="0050" |intse4=="0051" |intse4=="0052" |intse4=="0053" |intse4=="0054" |intse
4=="0056" |intse4=="0057" |intse4=="0066" |intse4=="1751" |intse4=="1752" |intse4=="3
500" |intse4=="3501" |intse4=="3502" |intse4=="3503" |intse4=="3504" |intse4=="3510" |
intse4=="3511" |intse4=="3512" |intse4=="3513" |intse4=="3514" |intse4=="3520" |intse
4=="3521" |intse4=="3522" |intse4=="3523" |intse4=="3524" |intse4=="3525" |intse4=="3
526" |intse4=="3527" |intse4=="3528" |intse4=="3531" |intse4=="3532" |intse4=="3533" |
intse4=="3534" |intse4=="3535" |intse4=="3539" |intse4=="3541" |intse4=="3542" |intse
4=="3550" |intse4=="3551" |intse4=="3552" |intse4=="3553" |intse4=="3554" |intse4=="3
555" |intse4=="3560" |intse4=="3561" |intse4=="3562" |intse4=="3563" |intse4=="3570" |
intse4=="3571" |intse4=="3572" |intse4=="3573" |intse4=="3581" |intse4=="3582" |intse
4=="3583" |intse4=="3584" |intse4=="3591" |intse4=="3592" |intse4=="3593"
```

```
replace cardiac=1 if
intse4=="3594" |intse4=="3595" |intse4=="3596" |intse4=="3597" |intse4=="3598" |intse
4=="3599" |intse4=="3601" |intse4=="3602" |intse4=="3603" |intse4=="3604" |intse4=="3
605" |intse4=="3606" |intse4=="3607" |intse4=="3609" |intse4=="3610" |intse4=="3611" |
```

```
intse4=="3612"|intse4=="3613"|intse4=="3614"|intse4=="3615"|intse4=="3616"|intse4=="3617"|intse4=="3619"|intse4=="362"|intse4=="363"|intse4=="3631"|intse4=="3632"|intse4=="3633"|intse4=="3634"|intse4=="3639"|intse4=="3691"|intse4=="3699"|intse4=="3731"|intse4=="3732"|intse4=="3733"|intse4=="3734"|intse4=="3735"|intse4=="3736"|intse4=="3737"|intse4=="3741"|intse4=="375"|intse4=="3751"|intse4=="3752"|intse4=="3753"|intse4=="3754"|intse4=="3755"|intse4=="3760"|intse4=="3761"|intse4=="3762"|intse4=="3763"|intse4=="3764"|intse4=="3765"|intse4=="3766"|intse4=="3770"|intse4=="3771"|intse4=="3772"|intse4=="3773"|intse4=="3774"|intse4=="3775"|intse4=="3776"|intse4=="3777"|intse4=="3778"|intse4=="3779"|intse4=="3780"|intse4=="3781"|intse4=="3782"|intse4=="3783"|intse4=="3785"|intse4=="3786"|intse4=="3787"|intse4=="3789"|intse4=="3794"|intse4=="3795"|intse4=="3796"|intse4=="3797"|intse4=="3798"
```

```
replace cardiac=1 if  
intse5=="0050"|intse5=="0051"|intse5=="0052"|intse5=="0053"|intse5=="0054"|intse5=="0056"|intse5=="0057"|intse5=="0066"|intse5=="1751"|intse5=="1752"|intse5=="3500"|intse5=="3501"|intse5=="3502"|intse5=="3503"|intse5=="3504"|intse5=="3510"|intse5=="3511"|intse5=="3512"|intse5=="3513"|intse5=="3514"|intse5=="3520"|intse5=="3521"|intse5=="3522"|intse5=="3523"|intse5=="3524"|intse5=="3525"|intse5=="3526"|intse5=="3527"|intse5=="3528"|intse5=="3531"|intse5=="3532"|intse5=="3533"|intse5=="3534"|intse5=="3535"|intse5=="3539"|intse5=="3541"|intse5=="3542"|intse5=="3550"|intse5=="3551"|intse5=="3552"|intse5=="3553"|intse5=="3554"|intse5=="3555"|intse5=="3560"|intse5=="3561"|intse5=="3562"|intse5=="3563"|intse5=="3570"|intse5=="3571"|intse5=="3572"|intse5=="3573"|intse5=="3581"|intse5=="3582"|intse5=="3583"|intse5=="3584"|intse5=="3591"|intse5=="3592"|intse5=="3593"
```

```
replace cardiac=1 if  
intse5=="3594"|intse5=="3595"|intse5=="3596"|intse5=="3597"|intse5=="3598"|intse5=="3599"|intse5=="3601"|intse5=="3602"|intse5=="3603"|intse5=="3604"|intse5=="3605"|intse5=="3606"|intse5=="3607"|intse5=="3609"|intse5=="3610"|intse5=="3611"|intse5=="3612"|intse5=="3613"|intse5=="3614"|intse5=="3615"|intse5=="3616"|intse5=="3617"|intse5=="3619"|intse5=="362"|intse5=="363"|intse5=="3631"|intse5=="3632"|intse5=="3633"|intse5=="3634"|intse5=="3639"|intse5=="3691"|intse5=="3699"|intse5=="3731"|intse5=="3732"|intse5=="3733"|intse5=="3734"|intse5=="3735"|intse5=="3736"|intse5=="3737"|intse5=="3741"|intse5=="375"|intse5=="3751"|intse5=="3752"|intse5=="3753"|intse5=="3754"|intse5=="3755"|intse5=="3760"|intse5=="3761"|intse5=="3762"|intse5=="3763"|intse5=="3764"|intse5=="3765"|intse5=="3766"|intse5=="3770"|intse5=="3771"|intse5=="3772"|intse5=="3773"|intse5=="3774"|intse5=="3775"|intse5=="3776"|intse5=="3777"|intse5=="3778"|intse5=="3779"|intse5=="3780"|intse5=="3781"|intse5=="3782"|intse5=="3783"|intse5=="3785"|intse5=="3786"|intse5=="3787"|intse5=="3789"|intse5=="3794"|intse5=="3795"|intse5=="3796"|intse5=="3797"|intse5=="3798"
```

```
replace pqi7hypert=0 if cardiac==1
```

```
replace pqi7hypert=. if age<18
```

```
replace pqi7hypert=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
```

```
replace pqi7hypert=. if drg>=370&drg<=384
```

```
replace pqi7hypert=. if sex==.|age==.
```



## PQI 8 - Congestive heart failure

---

```
gen pqi8scomp=1 if
diagpri=="39891"|diagpri=="4280"|diagpri=="4281"|diagpri=="42820"|diagpri=="4282
1"|diagpri=="42822"|diagpri=="42823"|diagpri=="42830"|diagpri=="42831"|diagpri=="
42832"|diagpri=="42833"|diagpri=="42840"|diagpri=="42841"|diagpri=="42842"|diag
pri=="42843"|diagpri=="4289"

replace pqi8scomp=0 if pqi8scomp==.

replace pqi8scomp=0 if cardiac==1

replace pqi8scomp=. if age<18
replace pqi8scomp=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
replace pqi8scomp=. if drg>=370&drg<=384
replace pqi8scomp=. if sex==.|age==.
```

## PQI 10 - Dehydration

---

```
gen pqil0disid=1 if
diagpri=="2765" |diagpri=="27650" |diagpri=="27651" |diagpri=="27652"

replace pqil0disid=0 if pqil0disid==.

gen tempdisid=1 if
diagn1=="2765" |diagn1=="27650" |diagn1=="27651" |diagn1=="27652"
replace tempdisid=1 if
diagn2=="2765" |diagn2=="27650" |diagn2=="27651" |diagn2=="27652"
replace tempdisid=1 if
diagn3=="2765" |diagn3=="27650" |diagn3=="27651" |diagn3=="27652"
replace tempdisid=1 if
diagn4=="2765" |diagn4=="27650" |diagn4=="27651" |diagn4=="27652"
replace tempdisid=1 if
diagn5=="2765" |diagn5=="27650" |diagn5=="27651" |diagn5=="27652"

gen miscellaneous=1 if
diagpri=="2760" |diagpri=="00861" |diagpri=="00862" |diagpri=="00863" |diagpri=="008
64" |diagpri=="00865" |diagpri=="00866" |diagpri=="00867" |diagpri=="00869" |diagpri=
=="0088" |diagpri=="0090" |diagpri=="0091" |diagpri=="0092" |diagpri=="0093" |diagpri=
=="5589" |diagpri=="5845" |diagpri=="5846" |diagpri=="5847" |diagpri=="5848" |diagpri=
=="5849" |diagpri=="586" |diagpri=="9975"

replace pqil0disid=1 if tempdisid==1&miscellaneous==1

drop tempdisid miscellaneous

gen ckidney=1 if
diagpri=="40300" |diagpri=="40301" |diagpri=="40310" |diagpri=="40311" |diagpri=="40
390" |diagpri=="40391" |diagpri=="40400" |diagpri=="40401" |diagpri=="40402" |diagpri
=="40403" |diagpri=="40410" |diagpri=="40411" |diagpri=="40412" |diagpri=="40413" |di
agpri=="40490" |diagpri=="40491" |diagpri=="40492" |diagpri=="40493" |diagpri=="5851
" |diagpri=="5852" |diagpri=="5853" |diagpri=="5854" |diagpri=="5855" |diagpri=="5856
"

replace ckidney=1 if
diagn1=="40300" |diagn1=="40301" |diagn1=="40310" |diagn1=="40311" |diagn1=="40390" |
diagn1=="40391" |diagn1=="40400" |diagn1=="40401" |diagn1=="40402" |diagn1=="40403" |
diagn1=="40410" |diagn1=="40411" |diagn1=="40412" |diagn1=="40413" |diagn1=="40490" |
diagn1=="40491" |diagn1=="40492" |diagn1=="40493" |diagn1=="5851" |diagn1=="5852" |di
agn1=="5853" |diagn1=="5854" |diagn1=="5855" |diagn1=="5856"
replace ckidney=1 if
diagn2=="40300" |diagn2=="40301" |diagn2=="40310" |diagn2=="40311" |diagn2=="40390" |
diagn2=="40391" |diagn2=="40400" |diagn2=="40401" |diagn2=="40402" |diagn2=="40403" |
diagn2=="40410" |diagn2=="40411" |diagn2=="40412" |diagn2=="40413" |diagn2=="40490" |
diagn2=="40491" |diagn2=="40492" |diagn2=="40493" |diagn2=="5851" |diagn2=="5852" |di
agn2=="5853" |diagn2=="5854" |diagn2=="5855" |diagn2=="5856"
replace ckidney=1 if
diagn3=="40300" |diagn3=="40301" |diagn3=="40310" |diagn3=="40311" |diagn3=="40390" |
diagn3=="40391" |diagn3=="40400" |diagn3=="40401" |diagn3=="40402" |diagn3=="40403" |
diagn3=="40410" |diagn3=="40411" |diagn3=="40412" |diagn3=="40413" |diagn3=="40490" |
diagn3=="40491" |diagn3=="40492" |diagn3=="40493" |diagn3=="5851" |diagn3=="5852" |di
agn3=="5853" |diagn3=="5854" |diagn3=="5855" |diagn3=="5856"
replace ckidney=1 if
diagn4=="40300" |diagn4=="40301" |diagn4=="40310" |diagn4=="40311" |diagn4=="40390" |
diagn4=="40391" |diagn4=="40400" |diagn4=="40401" |diagn4=="40402" |diagn4=="40403" |
diagn4=="40410" |diagn4=="40411" |diagn4=="40412" |diagn4=="40413" |diagn4=="40490" |
diagn4=="40491" |diagn4=="40492" |diagn4=="40493" |diagn4=="5851" |diagn4=="5852" |di
agn4=="5853" |diagn4=="5854" |diagn4=="5855" |diagn4=="5856"
```

```
replace ckidney=1 if
diagn5=="40300" |diagn5=="40301" |diagn5=="40310" |diagn5=="40311" |diagn5=="40390" |
diagn5=="40391" |diagn5=="40400" |diagn5=="40401" |diagn5=="40402" |diagn5=="40403" |
diagn5=="40410" |diagn5=="40411" |diagn5=="40412" |diagn5=="40413" |diagn5=="40490" |
diagn5=="40491" |diagn5=="40492" |diagn5=="40493" |diagn5=="5851" |diagn5=="5852" |di
agn5=="5853" |diagn5=="5854" |diagn5=="5855" |diagn5=="5856"
```

```
replace pqil0disid=0 if ckidney==1
```

```
drop ckidney
```

```
replace pqil0disid=. if age<18
```

```
replace pqil0disid=. if provenienza=="4" |provenienza=="5" |provenienza=="6"
```

```
replace pqil0disid=. if drg>=370&drg<=384
```

```
replace pqil0disid=. if sex==. |age==.
```

PQI 11 - Bacterial pneumonia

---

```
gen pqillpneum=1 if
diagpri=="481" |diagpri=="4822" |diagpri=="48230" |diagpri=="48231" |diagpri=="48232
" |diagpri=="48239" |diagpri=="48241" |diagpri=="48242" |diagpri=="4829" |diagpri=="4
830" |diagpri=="4831" |diagpri=="4838" |diagpri=="485" |diagpri=="486"

replace pqillpneum=0 if pqillpneum==.

replace pqillpneum=0 if
diagpri=="28241" |diagpri=="28242" |diagpri=="28260" |diagpri=="28261" |diagpri=="28
262" |diagpri=="28263" |diagpri=="28264" |diagpri=="28268" |diagpri=="28269"
replace pqillpneum=0 if
diagn1=="28241" |diagn1=="28242" |diagn1=="28260" |diagn1=="28261" |diagn1=="28262" |
diagn1=="28263" |diagn1=="28264" |diagn1=="28268" |diagn1=="28269"
replace pqillpneum=0 if
diagn2=="28241" |diagn2=="28242" |diagn2=="28260" |diagn2=="28261" |diagn2=="28262" |
diagn2=="28263" |diagn2=="28264" |diagn2=="28268" |diagn2=="28269"
replace pqillpneum=0 if
diagn3=="28241" |diagn3=="28242" |diagn3=="28260" |diagn3=="28261" |diagn3=="28262" |
diagn3=="28263" |diagn3=="28264" |diagn3=="28268" |diagn3=="28269"
replace pqillpneum=0 if
diagn4=="28241" |diagn4=="28242" |diagn4=="28260" |diagn4=="28261" |diagn4=="28262" |
diagn4=="28263" |diagn4=="28264" |diagn4=="28268" |diagn4=="28269"
replace pqillpneum=0 if
diagn5=="28241" |diagn5=="28242" |diagn5=="28260" |diagn5=="28261" |diagn5=="28262" |
diagn5=="28263" |diagn5=="28264" |diagn5=="28268" |diagn5=="28269"

gen immuno=1 if
diagpri=="042" |diagpri=="1363" |diagpri=="1992" |diagpri=="23873" |diagpri=="23876"
|diagpri=="23877" |diagpri=="23879" |diagpri=="260" |diagpri=="261" |diagpri=="262" |
diagpri=="27900" |diagpri=="27901" |diagpri=="27902" |diagpri=="27903" |diagpri=="27
904" |diagpri=="27905" |diagpri=="27906" |diagpri=="27909" |diagpri=="27910" |diagpri
=="27911" |diagpri=="27912" |diagpri=="27913" |diagpri=="27919" |diagpri=="2792" |dia
gpri=="2793" |diagpri=="2794" |diagpri=="27941" |diagpri=="27949" |diagpri=="27950" |
diagpri=="27951" |diagpri=="27952" |diagpri=="27953" |diagpri=="2798" |diagpri=="279
9" |diagpri=="28409" |diagpri=="2841" |diagpri=="2880" |diagpri=="28800" |diagpri=="2
8801" |diagpri=="28802" |diagpri=="28803" |diagpri=="28809" |diagpri=="2882" |diagpri
=="2884" |diagpri=="28850" |diagpri=="28851" |diagpri=="28859" |diagpri=="28953" |dia
gpri=="28983" |diagpri=="40301" |diagpri=="40311" |diagpri=="40391" |diagpri=="40402
" |diagpri=="40403" |diagpri=="40412" |diagpri=="40413" |diagpri=="40492"
replace immuno=1 if
diagpri=="40493" |diagpri=="5793" |diagpri=="585" |diagpri=="5855" |diagpri=="5856" |
diagpri=="9968" |diagpri=="99680" |diagpri=="99681" |diagpri=="99682" |diagpri=="996
83" |diagpri=="99684" |diagpri=="99685" |diagpri=="99686" |diagpri=="99687" |diagpri=
=="99689" |diagpri=="V420" |diagpri=="V421" |diagpri=="V426" |diagpri=="V427" |diagpri
=="V428" |diagpri=="V4281" |diagpri=="V4282" |diagpri=="V4283" |diagpri=="V4284" |dia
gpri=="V4289" |diagpri=="V451" |diagpri=="V4511" |diagpri=="V560" |diagpri=="V561" |d
iagpri=="V562" |diagpri=="0018" |diagpri=="335" |diagpri=="3350" |diagpri=="3351" |di
agpri=="3352" |diagpri=="336" |diagpri=="375" |diagpri=="3751" |diagpri=="410" |diagp
ri=="4100" |diagpri=="4101" |diagpri=="4102" |diagpri=="4103" |diagpri=="4104" |diagp
ri=="4105" |diagpri=="4106" |diagpri=="4107" |diagpri=="4108" |diagpri=="4109" |diagp
ri=="5051" |diagpri=="5059" |diagpri=="5280" |diagpri=="5281" |diagpri=="5282" |diagp
ri=="5283" |diagpri=="5285" |diagpri=="5286" |diagpri=="5569"

replace immuno=1 if
diagn1=="042" |diagn1=="1363" |diagn1=="1992" |diagn1=="23873" |diagn1=="23876" |diag
n1=="23877" |diagn1=="23879" |diagn1=="260" |diagn1=="261" |diagn1=="262" |diagn1=="2
7900" |diagn1=="27901" |diagn1=="27902" |diagn1=="27903" |diagn1=="27904" |diagn1=="2
7905" |diagn1=="27906" |diagn1=="27909" |diagn1=="27910" |diagn1=="27911" |diagn1=="2
```

7912" |diagn1=="27913" |diagn1=="27919" |diagn1=="2792" |diagn1=="2793" |diagn1=="2794" |diagn1=="27941" |diagn1=="27949" |diagn1=="27950" |diagn1=="27951" |diagn1=="27952" |diagn1=="27953" |diagn1=="2798" |diagn1=="2799" |diagn1=="28409" |diagn1=="2841" |diagn1=="2880" |diagn1=="28800" |diagn1=="28801" |diagn1=="28802" |diagn1=="28803" |diagn1=="28809" |diagn1=="2882" |diagn1=="2884" |diagn1=="28850" |diagn1=="28851" |diagn1=="28859" |diagn1=="28953" |diagn1=="28983" |diagn1=="40301" |diagn1=="40311" |diagn1=="40391" |diagn1=="40402" |diagn1=="40403" |diagn1=="40412" |diagn1=="40413" |diagn1=="40492"

replace immuno=1 if

diagn1=="40493" |diagn1=="5793" |diagn1=="585" |diagn1=="5855" |diagn1=="5856" |diagn1=="9968" |diagn1=="99680" |diagn1=="99681" |diagn1=="99682" |diagn1=="99683" |diagn1=="99684" |diagn1=="99685" |diagn1=="99686" |diagn1=="99687" |diagn1=="99689" |diagn1=="V420" |diagn1=="V421" |diagn1=="V426" |diagn1=="V427" |diagn1=="V428" |diagn1=="V4281" |diagn1=="V4282" |diagn1=="V4283" |diagn1=="V4284" |diagn1=="V4289" |diagn1=="V451" |diagn1=="V4511" |diagn1=="V560" |diagn1=="V561" |diagn1=="V562" |diagn1=="0018" |diagn1=="335" |diagn1=="3350" |diagn1=="3351" |diagn1=="3352" |diagn1=="336" |diagn1=="375" |diagn1=="3751" |diagn1=="410" |diagn1=="4100" |diagn1=="4101" |diagn1=="4102" |diagn1=="4103" |diagn1=="4104" |diagn1=="4105" |diagn1=="4106" |diagn1=="4107" |diagn1=="4108" |diagn1=="4109" |diagn1=="5051" |diagn1=="5059" |diagn1=="5280" |diagn1=="5281" |diagn1=="5282" |diagn1=="5283" |diagn1=="5285" |diagn1=="5286" |diagn1=="5569"

replace immuno=1 if

diagn2=="042" |diagn2=="1363" |diagn2=="1992" |diagn2=="23873" |diagn2=="23876" |diagn2=="23877" |diagn2=="23879" |diagn2=="260" |diagn2=="261" |diagn2=="262" |diagn2=="27900" |diagn2=="27901" |diagn2=="27902" |diagn2=="27903" |diagn2=="27904" |diagn2=="27905" |diagn2=="27906" |diagn2=="27909" |diagn2=="27910" |diagn2=="27911" |diagn2=="27912" |diagn2=="27913" |diagn2=="27919" |diagn2=="2792" |diagn2=="2793" |diagn2=="2794" |diagn2=="27941" |diagn2=="27949" |diagn2=="27950" |diagn2=="27951" |diagn2=="27952" |diagn2=="27953" |diagn2=="2798" |diagn2=="2799" |diagn2=="28409" |diagn2=="2841" |diagn2=="2880" |diagn2=="28800" |diagn2=="28801" |diagn2=="28802" |diagn2=="28803" |diagn2=="28809" |diagn2=="2882" |diagn2=="2884" |diagn2=="28850" |diagn2=="28851" |diagn2=="28859" |diagn2=="28953" |diagn2=="28983" |diagn2=="40301" |diagn2=="40311" |diagn2=="40391" |diagn2=="40402" |diagn2=="40403" |diagn2=="40412" |diagn2=="40413" |diagn2=="40492"

replace immuno=1 if

diagn2=="40493" |diagn2=="5793" |diagn2=="585" |diagn2=="5855" |diagn2=="5856" |diagn2=="9968" |diagn2=="99680" |diagn2=="99681" |diagn2=="99682" |diagn2=="99683" |diagn2=="99684" |diagn2=="99685" |diagn2=="99686" |diagn2=="99687" |diagn2=="99689" |diagn2=="V420" |diagn2=="V421" |diagn2=="V426" |diagn2=="V427" |diagn2=="V428" |diagn2=="V4281" |diagn2=="V4282" |diagn2=="V4283" |diagn2=="V4284" |diagn2=="V4289" |diagn2=="V451" |diagn2=="V4511" |diagn2=="V560" |diagn2=="V561" |diagn2=="V562" |diagn2=="0018" |diagn2=="335" |diagn2=="3350" |diagn2=="3351" |diagn2=="3352" |diagn2=="336" |diagn2=="375" |diagn2=="3751" |diagn2=="410" |diagn2=="4100" |diagn2=="4101" |diagn2=="4102" |diagn2=="4103" |diagn2=="4104" |diagn2=="4105" |diagn2=="4106" |diagn2=="4107" |diagn2=="4108" |diagn2=="4109" |diagn2=="5051" |diagn2=="5059" |diagn2=="5280" |diagn2=="5281" |diagn2=="5282" |diagn2=="5283" |diagn2=="5285" |diagn2=="5286" |diagn2=="5569"

replace immuno=1 if

diagn3=="042" |diagn3=="1363" |diagn3=="1992" |diagn3=="23873" |diagn3=="23876" |diagn3=="23877" |diagn3=="23879" |diagn3=="260" |diagn3=="261" |diagn3=="262" |diagn3=="27900" |diagn3=="27901" |diagn3=="27902" |diagn3=="27903" |diagn3=="27904" |diagn3=="27905" |diagn3=="27906" |diagn3=="27909" |diagn3=="27910" |diagn3=="27911" |diagn3=="27912" |diagn3=="27913" |diagn3=="27919" |diagn3=="2792" |diagn3=="2793" |diagn3=="2794" |diagn3=="27941" |diagn3=="27949" |diagn3=="27950" |diagn3=="27951" |diagn3=="27952" |diagn3=="27953" |diagn3=="2798" |diagn3=="2799" |diagn3=="28409" |diagn3=="2841" |diagn3=="2880" |diagn3=="28800" |diagn3=="28801" |diagn3=="28802" |diagn3=="28803" |diagn3=="28809" |diagn3=="2882" |diagn3=="2884" |diagn3=="28850" |diagn3=="28851" |diagn3=="28859" |diagn3=="28953" |diagn3=="28983" |diagn3=="40301" |diagn3=="40311" |diagn3=="40391" |diagn3=="40402" |diagn3=="40403" |diagn3=="40412" |diagn3=="40413" |diagn3=="40492"

replace immuno=1 if

diagn3=="40493" |diagn3=="5793" |diagn3=="585" |diagn3=="5855" |diagn3=="5856" |diagn3=="9968" |diagn3=="99680" |diagn3=="99681" |diagn3=="99682" |diagn3=="99683" |diagn3=="99684" |diagn3=="99685" |diagn3=="99686" |diagn3=="99687" |diagn3=="99689" |diagn3=="V420" |diagn3=="V421" |diagn3=="V426" |diagn3=="V427" |diagn3=="V428" |diagn3=="V4281" |diagn3=="V4282" |diagn3=="V4283" |diagn3=="V4284" |diagn3=="V4289" |diagn3=="V451" |diagn3=="V4511" |diagn3=="V560" |diagn3=="V561" |diagn3=="V562" |diagn3=="0018" |diagn3=="335" |diagn3=="3350" |diagn3=="3351" |diagn3=="3352" |diagn3=="336" |diagn3=="375" |diagn3=="3751" |diagn3=="410" |diagn3=="4100" |diagn3=="4101" |diagn3=="4102" |diagn3=="4103" |diagn3=="4104" |diagn3=="4105" |diagn3=="4106" |diagn3=="4107" |diagn3=="4108" |diagn3=="4109" |diagn3=="5051" |diagn3=="5059" |diagn3=="5280" |diagn3=="5281" |diagn3=="5282" |diagn3=="5283" |diagn3=="5285" |diagn3=="5286" |diagn3=="5569"

3=="9968" |diagn3=="99680" |diagn3=="99681" |diagn3=="99682" |diagn3=="99683" |diagn3  
=="99684" |diagn3=="99685" |diagn3=="99686" |diagn3=="99687" |diagn3=="99689" |diagn3  
=="V420" |diagn3=="V421" |diagn3=="V426" |diagn3=="V427" |diagn3=="V428" |diagn3=="V4  
281" |diagn3=="V4282" |diagn3=="V4283" |diagn3=="V4284" |diagn3=="V4289" |diagn3=="V4  
51" |diagn3=="V4511" |diagn3=="V560" |diagn3=="V561" |diagn3=="V562" |diagn3=="0018" |  
diagn3=="335" |diagn3=="3350" |diagn3=="3351" |diagn3=="3352" |diagn3=="336" |diagn3=  
="375" |diagn3=="3751" |diagn3=="410" |diagn3=="4100" |diagn3=="4101" |diagn3=="4102"  
|diagn3=="4103" |diagn3=="4104" |diagn3=="4105" |diagn3=="4106" |diagn3=="4107" |diag  
n3=="4108" |diagn3=="4109" |diagn3=="5051" |diagn3=="5059" |diagn3=="5280" |diagn3=="  
5281" |diagn3=="5282" |diagn3=="5283" |diagn3=="5285" |diagn3=="5286" |diagn3=="5569"

replace immuno=1 if

diagn4=="042" |diagn4=="1363" |diagn4=="1992" |diagn4=="23873" |diagn4=="23876" |diag  
n4=="23877" |diagn4=="23879" |diagn4=="260" |diagn4=="261" |diagn4=="262" |diagn4=="2  
7900" |diagn4=="27901" |diagn4=="27902" |diagn4=="27903" |diagn4=="27904" |diagn4=="2  
7905" |diagn4=="27906" |diagn4=="27909" |diagn4=="27910" |diagn4=="27911" |diagn4=="2  
7912" |diagn4=="27913" |diagn4=="27919" |diagn4=="2792" |diagn4=="2793" |diagn4=="279  
4" |diagn4=="27941" |diagn4=="27949" |diagn4=="27950" |diagn4=="27951" |diagn4=="2795  
2" |diagn4=="27953" |diagn4=="2798" |diagn4=="2799" |diagn4=="28409" |diagn4=="2841" |  
diagn4=="2880" |diagn4=="28800" |diagn4=="28801" |diagn4=="28802" |diagn4=="28803" |d  
iagn4=="28809" |diagn4=="2882" |diagn4=="2884" |diagn4=="28850" |diagn4=="28851" |dia  
gn4=="28859" |diagn4=="28953" |diagn4=="28983" |diagn4=="40301" |diagn4=="40311" |dia  
gn4=="40391" |diagn4=="40402" |diagn4=="40403" |diagn4=="40412" |diagn4=="40413" |dia  
gn4=="40492"

replace immuno=1 if

diagn4=="40493" |diagn4=="5793" |diagn4=="585" |diagn4=="5855" |diagn4=="5856" |diagn  
4=="9968" |diagn4=="99680" |diagn4=="99681" |diagn4=="99682" |diagn4=="99683" |diagn4  
=="99684" |diagn4=="99685" |diagn4=="99686" |diagn4=="99687" |diagn4=="99689" |diagn4  
=="V420" |diagn4=="V421" |diagn4=="V426" |diagn4=="V427" |diagn4=="V428" |diagn4=="V4  
281" |diagn4=="V4282" |diagn4=="V4283" |diagn4=="V4284" |diagn4=="V4289" |diagn4=="V4  
51" |diagn4=="V4511" |diagn4=="V560" |diagn4=="V561" |diagn4=="V562" |diagn4=="0018" |  
diagn4=="335" |diagn4=="3350" |diagn4=="3351" |diagn4=="3352" |diagn4=="336" |diagn4=  
="375" |diagn4=="3751" |diagn4=="410" |diagn4=="4100" |diagn4=="4101" |diagn4=="4102"  
|diagn4=="4103" |diagn4=="4104" |diagn4=="4105" |diagn4=="4106" |diagn4=="4107" |diag  
n4=="4108" |diagn4=="4109" |diagn4=="5051" |diagn4=="5059" |diagn4=="5280" |diagn4=="  
5281" |diagn4=="5282" |diagn4=="5283" |diagn4=="5285" |diagn4=="5286" |diagn4=="5569"

replace immuno=1 if

diagn5=="042" |diagn5=="1363" |diagn5=="1992" |diagn5=="23873" |diagn5=="23876" |diag  
n5=="23877" |diagn5=="23879" |diagn5=="260" |diagn5=="261" |diagn5=="262" |diagn5=="2  
7900" |diagn5=="27901" |diagn5=="27902" |diagn5=="27903" |diagn5=="27904" |diagn5=="2  
7905" |diagn5=="27906" |diagn5=="27909" |diagn5=="27910" |diagn5=="27911" |diagn5=="2  
7912" |diagn5=="27913" |diagn5=="27919" |diagn5=="2792" |diagn5=="2793" |diagn5=="279  
4" |diagn5=="27941" |diagn5=="27949" |diagn5=="27950" |diagn5=="27951" |diagn5=="2795  
2" |diagn5=="27953" |diagn5=="2798" |diagn5=="2799" |diagn5=="28409" |diagn5=="2841" |  
diagn5=="2880" |diagn5=="28800" |diagn5=="28801" |diagn5=="28802" |diagn5=="28803" |d  
iagn5=="28809" |diagn5=="2882" |diagn5=="2884" |diagn5=="28850" |diagn5=="28851" |dia  
gn5=="28859" |diagn5=="28953" |diagn5=="28983" |diagn5=="40301" |diagn5=="40311" |dia  
gn5=="40391" |diagn5=="40402" |diagn5=="40403" |diagn5=="40412" |diagn5=="40413" |dia  
gn5=="40492"

replace immuno=1 if

diagn5=="40493" |diagn5=="5793" |diagn5=="585" |diagn5=="5855" |diagn5=="5856" |diagn  
5=="9968" |diagn5=="99680" |diagn5=="99681" |diagn5=="99682" |diagn5=="99683" |diagn5  
=="99684" |diagn5=="99685" |diagn5=="99686" |diagn5=="99687" |diagn5=="99689" |diagn5  
=="V420" |diagn5=="V421" |diagn5=="V426" |diagn5=="V427" |diagn5=="V428" |diagn5=="V4  
281" |diagn5=="V4282" |diagn5=="V4283" |diagn5=="V4284" |diagn5=="V4289" |diagn5=="V4  
51" |diagn5=="V4511" |diagn5=="V560" |diagn5=="V561" |diagn5=="V562" |diagn5=="0018" |  
diagn5=="335" |diagn5=="3350" |diagn5=="3351" |diagn5=="3352" |diagn5=="336" |diagn5=  
="375" |diagn5=="3751" |diagn5=="410" |diagn5=="4100" |diagn5=="4101" |diagn5=="4102"  
|diagn5=="4103" |diagn5=="4104" |diagn5=="4105" |diagn5=="4106" |diagn5=="4107" |diag  
n5=="4108" |diagn5=="4109" |diagn5=="5051" |diagn5=="5059" |diagn5=="5280" |diagn5=="  
5281" |diagn5=="5282" |diagn5=="5283" |diagn5=="5285" |diagn5=="5286" |diagn5=="5569"

```
replace pqillpneum=0 if immuno==1
```

```
replace pqillpneum=. if age<18
```

```
replace pqillpneum=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
```

```
replace pqillpneum=. if drg>=370&drg<=384
```

```
replace pqillpneum=. if sex==.|age==.
```

PQI 12 - Urinary tract infection

---

```
gen pqil2urin=1 if
diagpri=="59010" |diagpri=="59011" |diagpri=="5902" |diagpri=="5903" |diagpri=="5908
0" |diagpri=="59081" |diagpri=="5909" |diagpri=="5950" |diagpri=="5959" |diagpri=="59
90"

replace pqil2urin=0 if pqil2urin==.

replace pqil2urin=0 if
diagpri=="59000" |diagpri=="59001" |diagpri=="59370" |diagpri=="59371" |diagpri=="59
372" |diagpri=="59373" |diagpri=="7530" |diagpri=="75310" |diagpri=="75311" |diagpri=
"75312" |diagpri=="75313" |diagpri=="75314" |diagpri=="75315" |diagpri=="75316" |dia
gpri=="75317" |diagpri=="75319" |diagpri=="75320" |diagpri=="75321" |diagpri=="75322
" |diagpri=="75323" |diagpri=="75329" |diagpri=="7533" |diagpri=="7534" |diagpri=="75
35" |diagpri=="7536" |diagpri=="7538" |diagpri=="7539"
replace pqil2urin=0 if
diagn1=="59000" |diagn1=="59001" |diagn1=="59370" |diagn1=="59371" |diagn1=="59372" |
diagn1=="59373" |diagn1=="7530" |diagn1=="75310" |diagn1=="75311" |diagn1=="75312" |d
iagn1=="75313" |diagn1=="75314" |diagn1=="75315" |diagn1=="75316" |diagn1=="75317" |d
iagn1=="75319" |diagn1=="75320" |diagn1=="75321" |diagn1=="75322" |diagn1=="75323" |d
iagn1=="75329" |diagn1=="7533" |diagn1=="7534" |diagn1=="7535" |diagn1=="7536" |diagn
1=="7538" |diagn1=="7539"
replace pqil2urin=0 if
diagn2=="59000" |diagn2=="59001" |diagn2=="59370" |diagn2=="59371" |diagn2=="59372" |
diagn2=="59373" |diagn2=="7530" |diagn2=="75310" |diagn2=="75311" |diagn2=="75312" |d
iagn2=="75313" |diagn2=="75314" |diagn2=="75315" |diagn2=="75316" |diagn2=="75317" |d
iagn2=="75319" |diagn2=="75320" |diagn2=="75321" |diagn2=="75322" |diagn2=="75323" |d
iagn2=="75329" |diagn2=="7533" |diagn2=="7534" |diagn2=="7535" |diagn2=="7536" |diagn
2=="7538" |diagn2=="7539"
replace pqil2urin=0 if
diagn3=="59000" |diagn3=="59001" |diagn3=="59370" |diagn3=="59371" |diagn3=="59372" |
diagn3=="59373" |diagn3=="7530" |diagn3=="75310" |diagn3=="75311" |diagn3=="75312" |d
iagn3=="75313" |diagn3=="75314" |diagn3=="75315" |diagn3=="75316" |diagn3=="75317" |d
iagn3=="75319" |diagn3=="75320" |diagn3=="75321" |diagn3=="75322" |diagn3=="75323" |d
iagn3=="75329" |diagn3=="7533" |diagn3=="7534" |diagn3=="7535" |diagn3=="7536" |diagn
3=="7538" |diagn3=="7539"
replace pqil2urin=0 if
diagn4=="59000" |diagn4=="59001" |diagn4=="59370" |diagn4=="59371" |diagn4=="59372" |
diagn4=="59373" |diagn4=="7530" |diagn4=="75310" |diagn4=="75311" |diagn4=="75312" |d
iagn4=="75313" |diagn4=="75314" |diagn4=="75315" |diagn4=="75316" |diagn4=="75317" |d
iagn4=="75319" |diagn4=="75320" |diagn4=="75321" |diagn4=="75322" |diagn4=="75323" |d
iagn4=="75329" |diagn4=="7533" |diagn4=="7534" |diagn4=="7535" |diagn4=="7536" |diagn
4=="7538" |diagn4=="7539"
replace pqil2urin=0 if
diagn5=="59000" |diagn5=="59001" |diagn5=="59370" |diagn5=="59371" |diagn5=="59372" |
diagn5=="59373" |diagn5=="7530" |diagn5=="75310" |diagn5=="75311" |diagn5=="75312" |d
iagn5=="75313" |diagn5=="75314" |diagn5=="75315" |diagn5=="75316" |diagn5=="75317" |d
iagn5=="75319" |diagn5=="75320" |diagn5=="75321" |diagn5=="75322" |diagn5=="75323" |d
iagn5=="75329" |diagn5=="7533" |diagn5=="7534" |diagn5=="7535" |diagn5=="7536" |diagn
5=="7538" |diagn5=="7539"

replace pqil2urin=0 if immuno==1

drop immuno

replace pqil2urin=. if age<18
replace pqil2urin=. if provenienza=="4" |provenienza=="5" |provenienza=="6"
replace pqil2urin=. if drg>=370&drg<=384
replace pqil2urin=. if sex==. |age==.
```



### PQI 13 - Angina without procedure

---

```
gen pqil3angin=1 if  
diagpri=="4111"|diagpri=="41181"|diagpri=="41189"|diagpri=="4130"|diagpri=="4131"  
"|diagpri=="4139"
```

```
replace pqil3angin=0 if pqil3angin==.
```

```
replace pqil3angin=0 if cardiac==1
```

```
replace pqil3angin=. if age<18
```

```
replace pqil3angin=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
```

```
replace pqil3angin=. if drg>=370&drg<=384
```

```
replace pqil3angin=. if sex==.|age==.
```

## PQI 14 - Uncontrolled diabetes

---

```
gen pqil4diabunc=1 if diagpri=="25002"|diagpri=="25003"
```

```
replace pqil4diabunc=0 if pqil4diabunc==.
```

```
replace pqil4diabunc=0 if pqildiabshort==1
```

```
replace pqil4diabunc=0 if pqi3diablong==1
```

```
replace pqil4diabunc=. if age<18
```

```
replace pqil4diabunc=. if provenienza=="4"|provenienza=="5"|provenienza=="6"
```

```
replace pqil4diabunc=. if drg>=370&drg<=384
```

```
replace pqil4diabunc=. if sex==.|age==.
```

## PQI 15 - Asthma in younger adults

---

```
gen pqil5asma=1 if
diagpri=="49300" |diagpri=="49301" |diagpri=="49302" |diagpri=="49310" |diagpri=="49
311" |diagpri=="49312" |diagpri=="49320" |diagpri=="49321" |diagpri=="49322" |diagpri
=="49381" |diagpri=="49382" |diagpri=="49390" |diagpri=="49391" |diagpri=="49392"

replace pqil5asma=0 if pqil5asma==.

replace pqil5asma=0 if
diagpri=="27700" |diagpri=="27701" |diagpri=="27702" |diagpri=="27703" |diagpri=="27
709" |diagpri=="74721" |diagpri=="7483" |diagpri=="7484" |diagpri=="7485" |diagpri=="
74860" |diagpri=="74861" |diagpri=="74869" |diagpri=="7488" |diagpri=="7489" |diagpri
=="7503" |diagpri=="7593" |diagpri=="7707"
replace pqil5asma=0 if
diagn1=="27700" |diagn1=="27701" |diagn1=="27702" |diagn1=="27703" |diagn1=="27709" |
diagn1=="74721" |diagn1=="7483" |diagn1=="7484" |diagn1=="7485" |diagn1=="74860" |dia
gn1=="74861" |diagn1=="74869" |diagn1=="7488" |diagn1=="7489" |diagn1=="7503" |diagn1
=="7593" |diagn1=="7707"
replace pqil5asma=0 if
diagn2=="27700" |diagn2=="27701" |diagn2=="27702" |diagn2=="27703" |diagn2=="27709" |
diagn2=="74721" |diagn2=="7483" |diagn2=="7484" |diagn2=="7485" |diagn2=="74860" |dia
gn2=="74861" |diagn2=="74869" |diagn2=="7488" |diagn2=="7489" |diagn2=="7503" |diagn2
=="7593" |diagn2=="7707"
replace pqil5asma=0 if
diagn3=="27700" |diagn3=="27701" |diagn3=="27702" |diagn3=="27703" |diagn3=="27709" |
diagn3=="74721" |diagn3=="7483" |diagn3=="7484" |diagn3=="7485" |diagn3=="74860" |dia
gn3=="74861" |diagn3=="74869" |diagn3=="7488" |diagn3=="7489" |diagn3=="7503" |diagn3
=="7593" |diagn3=="7707"
replace pqil5asma=0 if
diagn4=="27700" |diagn4=="27701" |diagn4=="27702" |diagn4=="27703" |diagn4=="27709" |
diagn4=="74721" |diagn4=="7483" |diagn4=="7484" |diagn4=="7485" |diagn4=="74860" |dia
gn4=="74861" |diagn4=="74869" |diagn4=="7488" |diagn4=="7489" |diagn4=="7503" |diagn4
=="7593" |diagn4=="7707"
replace pqil5asma=0 if
diagn5=="27700" |diagn5=="27701" |diagn5=="27702" |diagn5=="27703" |diagn5=="27709" |
diagn5=="74721" |diagn5=="7483" |diagn5=="7484" |diagn5=="7485" |diagn5=="74860" |dia
gn5=="74861" |diagn5=="74869" |diagn5=="7488" |diagn5=="7489" |diagn5=="7503" |diagn5
=="7593" |diagn5=="7707"

replace pqil5asma=. if age>=40
replace pqil5asma=. if provenienza=="4" |provenienza=="5" |provenienza=="6"
replace pqil5asma=. if drg>=370&drg<=384
replace pqil5asma=. if sex==. |age==.
```

PQI 16 - Rate of lower-extremity amputation among diabetics

---

gen pqi16amput=.

```
gen amputation=1 if
intpri=="8410" | intpri=="8411" | intpri=="8412" | intpri=="8413" | intpri=="8414" | intpr
i=="8415" | intpri=="8416" | intpri=="8417" | intpri=="8418" | intpri=="8419"
replace amputation=1 if
intsel=="8410" | intsel=="8411" | intsel=="8412" | intsel=="8413" | intsel=="8414" | intse
l=="8415" | intsel=="8416" | intsel=="8417" | intsel=="8418" | intsel=="8419"
replace amputation=1 if
intse2=="8410" | intse2=="8411" | intse2=="8412" | intse2=="8413" | intse2=="8414" | intse
2=="8415" | intse2=="8416" | intse2=="8417" | intse2=="8418" | intse2=="8419"
replace amputation=1 if
intse3=="8410" | intse3=="8411" | intse3=="8412" | intse3=="8413" | intse3=="8414" | intse
3=="8415" | intse3=="8416" | intse3=="8417" | intse3=="8418" | intse3=="8419"
replace amputation=1 if
intse4=="8410" | intse4=="8411" | intse4=="8412" | intse4=="8413" | intse4=="8414" | intse
4=="8415" | intse4=="8416" | intse4=="8417" | intse4=="8418" | intse4=="8419"
replace amputation=1 if
intse5=="8410" | intse5=="8411" | intse5=="8412" | intse5=="8413" | intse5=="8414" | intse
5=="8415" | intse5=="8416" | intse5=="8417" | intse5=="8418" | intse5=="8419"
```

```
gen diabetes=1 if
diagpri=="25000" | diagpri=="25001" | diagpri=="25002" | diagpri=="25003" | diagpri=="25
010" | diagpri=="25011" | diagpri=="25012" | diagpri=="25013" | diagpri=="25020" | diagpri
=="25021" | diagpri=="25022" | diagpri=="25023" | diagpri=="25030" | diagpri=="25031" | di
agpri=="25032" | diagpri=="25033" | diagpri=="25040" | diagpri=="25041" | diagpri=="2504
2" | diagpri=="25043" | diagpri=="25050" | diagpri=="25051" | diagpri=="25052" | diagpri==
"25053" | diagpri=="25060" | diagpri=="25061" | diagpri=="25062" | diagpri=="25063" | diag
pri=="25070" | diagpri=="25071" | diagpri=="25072" | diagpri=="25073" | diagpri=="25080"
| diagpri=="25081" | diagpri=="25082" | diagpri=="25083" | diagpri=="25090" | diagpri=="2
5091" | diagpri=="25092" | diagpri=="25093"
replace diabetes=1 if
diagn1=="25000" | diagn1=="25001" | diagn1=="25002" | diagn1=="25003" | diagn1=="25010" |
diagn1=="25011" | diagn1=="25012" | diagn1=="25013" | diagn1=="25020" | diagn1=="25021" |
diagn1=="25022" | diagn1=="25023" | diagn1=="25030" | diagn1=="25031" | diagn1=="25032" |
diagn1=="25033" | diagn1=="25040" | diagn1=="25041" | diagn1=="25042" | diagn1=="25043" |
diagn1=="25050" | diagn1=="25051" | diagn1=="25052" | diagn1=="25053" | diagn1=="25060" |
diagn1=="25061" | diagn1=="25062" | diagn1=="25063" | diagn1=="25070" | diagn1=="25071" |
diagn1=="25072" | diagn1=="25073" | diagn1=="25080" | diagn1=="25081" | diagn1=="25082" |
diagn1=="25083" | diagn1=="25090" | diagn1=="25091" | diagn1=="25092" | diagn1=="25093"
replace diabetes=1 if
diagn2=="25000" | diagn2=="25001" | diagn2=="25002" | diagn2=="25003" | diagn2=="25010" |
diagn2=="25011" | diagn2=="25012" | diagn2=="25013" | diagn2=="25020" | diagn2=="25021" |
diagn2=="25022" | diagn2=="25023" | diagn2=="25030" | diagn2=="25031" | diagn2=="25032" |
diagn2=="25033" | diagn2=="25040" | diagn2=="25041" | diagn2=="25042" | diagn2=="25043" |
diagn2=="25050" | diagn2=="25051" | diagn2=="25052" | diagn2=="25053" | diagn2=="25060" |
diagn2=="25061" | diagn2=="25062" | diagn2=="25063" | diagn2=="25070" | diagn2=="25071" |
diagn2=="25072" | diagn2=="25073" | diagn2=="25080" | diagn2=="25081" | diagn2=="25082" |
diagn2=="25083" | diagn2=="25090" | diagn2=="25091" | diagn2=="25092" | diagn2=="25093"
replace diabetes=1 if
diagn3=="25000" | diagn3=="25001" | diagn3=="25002" | diagn3=="25003" | diagn3=="25010" |
diagn3=="25011" | diagn3=="25012" | diagn3=="25013" | diagn3=="25020" | diagn3=="25021" |
diagn3=="25022" | diagn3=="25023" | diagn3=="25030" | diagn3=="25031" | diagn3=="25032" |
diagn3=="25033" | diagn3=="25040" | diagn3=="25041" | diagn3=="25042" | diagn3=="25043" |
diagn3=="25050" | diagn3=="25051" | diagn3=="25052" | diagn3=="25053" | diagn3=="25060" |
diagn3=="25061" | diagn3=="25062" | diagn3=="25063" | diagn3=="25070" | diagn3=="25071" |
diagn3=="25072" | diagn3=="25073" | diagn3=="25080" | diagn3=="25081" | diagn3=="25082" |
diagn3=="25083" | diagn3=="25090" | diagn3=="25091" | diagn3=="25092" | diagn3=="25093"
```

```

replace diabetes=1 if
diagn4=="25000" |diagn4=="25001" |diagn4=="25002" |diagn4=="25003" |diagn4=="25010" |
diagn4=="25011" |diagn4=="25012" |diagn4=="25013" |diagn4=="25020" |diagn4=="25021" |
diagn4=="25022" |diagn4=="25023" |diagn4=="25030" |diagn4=="25031" |diagn4=="25032" |
diagn4=="25033" |diagn4=="25040" |diagn4=="25041" |diagn4=="25042" |diagn4=="25043" |
diagn4=="25050" |diagn4=="25051" |diagn4=="25052" |diagn4=="25053" |diagn4=="25060" |
diagn4=="25061" |diagn4=="25062" |diagn4=="25063" |diagn4=="25070" |diagn4=="25071" |
diagn4=="25072" |diagn4=="25073" |diagn4=="25080" |diagn4=="25081" |diagn4=="25082" |
diagn4=="25083" |diagn4=="25090" |diagn4=="25091" |diagn4=="25092" |diagn4=="25093"
replace diabetes=1 if
diagn5=="25000" |diagn5=="25001" |diagn5=="25002" |diagn5=="25003" |diagn5=="25010" |
diagn5=="25011" |diagn5=="25012" |diagn5=="25013" |diagn5=="25020" |diagn5=="25021" |
diagn5=="25022" |diagn5=="25023" |diagn5=="25030" |diagn5=="25031" |diagn5=="25032" |
diagn5=="25033" |diagn5=="25040" |diagn5=="25041" |diagn5=="25042" |diagn5=="25043" |
diagn5=="25050" |diagn5=="25051" |diagn5=="25052" |diagn5=="25053" |diagn5=="25060" |
diagn5=="25061" |diagn5=="25062" |diagn5=="25063" |diagn5=="25070" |diagn5=="25071" |
diagn5=="25072" |diagn5=="25073" |diagn5=="25080" |diagn5=="25081" |diagn5=="25082" |
diagn5=="25083" |diagn5=="25090" |diagn5=="25091" |diagn5=="25092" |diagn5=="25093"

replace pqil6amput=1 if amputation==1&diabetes==1

replace pqil6amput=0 if pqil6amput==.

drop amputation

replace pqil6amput=0 if
diagpri=="8950" |diagpri=="8951" |diagpri=="8960" |diagpri=="8961" |diagpri=="8962" |
diagpri=="8963" |diagpri=="8970" |diagpri=="8971" |diagpri=="8972" |diagpri=="8973" |
diagpri=="8974" |diagpri=="8975" |diagpri=="8976" |diagpri=="8977"
replace pqil6amput=0 if
diagn1=="8950" |diagn1=="8951" |diagn1=="8960" |diagn1=="8961" |diagn1=="8962" |diagn
1=="8963" |diagn1=="8970" |diagn1=="8971" |diagn1=="8972" |diagn1=="8973" |diagn1=="8
974" |diagn1=="8975" |diagn1=="8976" |diagn1=="8977"
replace pqil6amput=0 if
diagn2=="8950" |diagn2=="8951" |diagn2=="8960" |diagn2=="8961" |diagn2=="8962" |diagn
2=="8963" |diagn2=="8970" |diagn2=="8971" |diagn2=="8972" |diagn2=="8973" |diagn2=="8
974" |diagn2=="8975" |diagn2=="8976" |diagn2=="8977"
replace pqil6amput=0 if
diagn3=="8950" |diagn3=="8951" |diagn3=="8960" |diagn3=="8961" |diagn3=="8962" |diagn
3=="8963" |diagn3=="8970" |diagn3=="8971" |diagn3=="8972" |diagn3=="8973" |diagn3=="8
974" |diagn3=="8975" |diagn3=="8976" |diagn3=="8977"
replace pqil6amput=0 if
diagn4=="8950" |diagn4=="8951" |diagn4=="8960" |diagn4=="8961" |diagn4=="8962" |diagn
4=="8963" |diagn4=="8970" |diagn4=="8971" |diagn4=="8972" |diagn4=="8973" |diagn4=="8
974" |diagn4=="8975" |diagn4=="8976" |diagn4=="8977"
replace pqil6amput=0 if
diagn5=="8950" |diagn5=="8951" |diagn5=="8960" |diagn5=="8961" |diagn5=="8962" |diagn
5=="8963" |diagn5=="8970" |diagn5=="8971" |diagn5=="8972" |diagn5=="8973" |diagn5=="8
974" |diagn5=="8975" |diagn5=="8976" |diagn5=="8977"

replace pqil6amput=0 if
intpri=="8411" |intsel=="8411" |intse2=="8411" |intse3=="8411" |intse4=="8411" |intse
5=="8411"

replace pqil6amput=. if age<18
replace pqil6amput=. if provenienza=="4" |provenienza=="5" |provenienza=="6"
replace pqil6amput=. if drg>=370&drg<=384
replace pqil6amput=. if sex==. |age==.

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