Did a physician-targeted intervention that reduced potentially inappropriate prescribing to elderly patients also reduce related hospitalizations?

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The RER database does not include inpatient medications (potential
Annual reviews of incidence of PIM use in the elderly.
When the intervention was introduced in 2008, there were 906,810
Approximately 411 PIM
Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, and Mitchell AA. Recent Patterns of Medication Use in the Ambulatory Adult
Maio V, Yuen EJ, Novielli K, et al. Potentially inappropriate medication prescribing for elderly outpatients in Emilia 126 S.
Calculations
Demographics
RESULTS
The three components of the intervention included: 1. Circulation of a developed list of PIM to “always be avoided” and a list of alternatives.
2. Annual reviews of incidence of PIM use in the elderly. 3. Educational sessions on PIM use (academic, case reviews).
Comparators
We evaluated the effectiveness of the physician-directed PIM intervention by comparing the risk of PIM-related hospitalizations for residents under the care of a general practitioner (GP) in Parma LHA during and after intervention (post-intervention, 1/1/2008–9/30/2011) to residents under the care of a GP in the rest of the RER (Non-Parma).
Study Population
Study time period: 01/01/2005 – 09/30/2011.
• Elderly individuals (≥65 years old) who were residents of RER for at least one year were included in the cohort.
• Individuals exited the cohort at the earliest time they met one of the following criteria: death, moved out of the region, or hospitalization for more than 30 consecutive days.
Modeling
We developed a time-dependent covariate, repeated-events, Cox Proportional Hazard Model using fully-linked longitudinal administrative data from the RER database.
• Event of interest: PIM-related hospitalizations, defined as an unplanned, inpatient hospitalization occurring during PIM exposure.
• Definition of PIM drugs that were used for the analysis, according to the 2007 Maio Criteria.6
• To estimate PIM exposure we computed the number of days supplied for each medication of interest (using Defined Daily Doses) and added 30 days to capture any residual effects of a PIM. An individual was considered exposed to PIM from the date the prescription was filled until 30 days after the prescription was expected to end based on DDD.
• Adjustments for the outcome included: age, gender, number of non-PIM hospitalizations (in the previous four quarters), number of chronic condition drug groups (CCDGs) (in the previous four quarters).
Calculations
Demographics were summarized for Parma and Non-Parma at the start of the intervention (01/01/2008).
• Unadjusted PIM exposure and PIM-related hospitalizations were estimated for Parma vs. Non-Parma residents.
• We used Cox modeling to estimate adjusted hazard ratios (HRs) of PIM-related hospitalizations for Parma post vs. pre-intervention.
• We calculated the number of PIM-related hospitalizations avoided in Parma post-intervention vs. pre-intervention (Figure 1).

Figure 1. Equations for Hospitalizations Avoided
Preventable Fraction = 1 – HR

RESULTS
Demographics
When the intervention was introduced in 2008, there were 906,810 elderly residents in the Emilia-Romagna region and approximately 1/10 were under the care of a Parma GP.
• The exposure to PIM, PIM hospitalizations, and comorbid status, gender, and age strata of residents in Parma and Non-Parma were similar.

Hazard Ratios
• Compared with others in the RER during the same periods, Parma residents post-intervention had 7% less likely to have a PIM-related hospitalization than pre-intervention (Table 2).
• We estimated that approximately 411 PIM-related hospitalizations were avoided due to the intervention.

Table 2. Cox Model Results

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<th>Variable</th>
<th>HR (95% CI)</th>
<th>P value</th>
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<tbody>
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</tr>
<tr>
<td>Death during hospital</td>
<td>1.0 (1.0)</td>
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CONCLUSIONS
• Approximately 411 PIM-related hospitalizations were avoided in Parma LHA and elderly residents during post-intervention were at significantly lower risks of PIM-related hospitalizations than pre-intervention.
• We believe that the observed decline in PIM hospitalizations within Parma LHA was attributable to the decreased exposure to PIMs.
• To our knowledge this is the first study to evaluate the effectiveness of a multi-year, PIM awareness program with respect to incident PIM hospitalizations.
• We believe that the observed decreased risk of PIM-related hospitalizations in Parma LHA post-intervention was due to changes in physician behavior.
• We urge researchers to continue to evaluate the effectiveness of interventions targeted at increasing awareness of the potential harms of PIM in the elderly.