POSTER
#EE268

PER-MEMBER PER-MONTH (PMPM) EXPENDITURE VALUE IN ONCOLOGY: UPDATING A FOCUSED LITERATURE REVIEW

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Background

- Payer listing of new technology and healthcare decision-making in the United States (US) often relies on economic burden value-propositions and budget impact information. US-focused budget impact models commonly provide results using the per-member per-month (PMPM) expenditure. Evaluating PMPM costs can be challenging.

Objective

- The objective is to update a previous review which investigated the factors affecting as well as determining the distribution of PMPM values in oncology.

Key Results

- There is an increasing trend in published literature reporting PMPM.
- The most common reporting scenarios were 1,000,000 member scenarios and perspectives from Medicare and commercial plans.
- Respiratory, hematology, urology, and gastroenterology fields produced the most papers with PMPM values.
- Reported PMPM values often were for treatment interventions and had a mean value of $0.0235.
- There were fewer PMPM reports and therefore weakened validity for interventions in diagnosis, prevention, and screening, which had mean values of $0.0011, –$0.0400, and $0.2000, respectively.

Conclusion

- Utilization of PMPM in budget impact models is increasing in the US. However, the quality of calculating and reporting PMPM values needs to be improved by considering all influential factors. This research concluded that respiratory, hematology, and urology fields report PMPM values most often, ovarian cancer had the highest treatment-specific mean incremental PMPM value, and Medicare tended to have higher PMPM values than commercial plans.

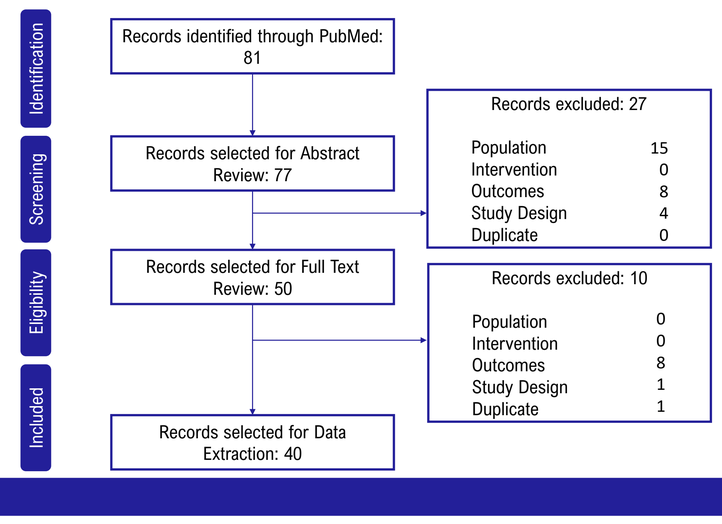
Methods

Table 1: PICOS used in the selection process

PICOS	Inclusion	Exclusion
Patient population	• Patients diagnosed with any type of cancer	• Patients without cancer • No specific tumor type provided
Intervention and Comparators	• Not applicable	• Not applicable
Outcomes measures	• PMPM	• Other outcomes except PMPM
Study design	• Prospective observational studies • Retrospective studies • Interventional studies • Database analyses • Registries • Systematic reviews and meta-analyses • Pooled analyses	• Case reports • Notes/Comments/Letters • Non-human • Case series • Editorial • Review • Published studies before 2000

- A targeted literature search was conducted on June 13th, 2022, using the PubMed database, and PMPM data from studies (published between 2000-2022) on different types of malignancies were extracted.
- Incremental PMPM value was the outcome of interest. Details on inclusion and exclusion criteria are depicted in **Table 1**.
- 40 of the 81 studies initially identified met the inclusion criteria. Four were excluded from abstract review due to inaccessibility.
- All studies were conducted from a US perspective, with 70% estimating a 1-million-member plan.
- There is an increasing trend of eligible published studies reporting PMPM values in the field of oncology.

Figure 1: PRISMA



Results

TRENDS IN PUBLISHED LITERATURE

- Of the reported PMPM values, 26% were in lung cancer, followed by 16% in hematology (including leukemia, non-myeloid malignancy, and multiple myeloma), 16% in urology (including renal cell carcinoma and prostate cancer), and 16% in gastroenterology (including ovarian cancer, gastrointestinal stromal tumors, and colorectal cancer).

Figure 2a: Fields of Relevant Studies

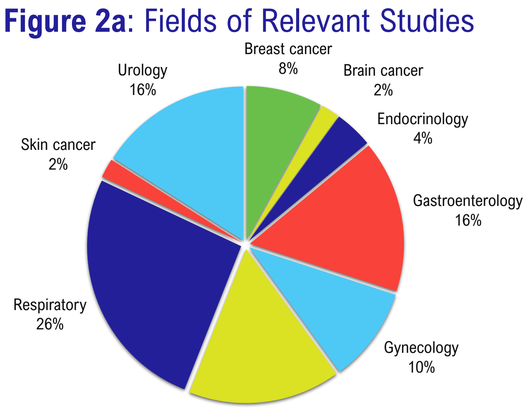
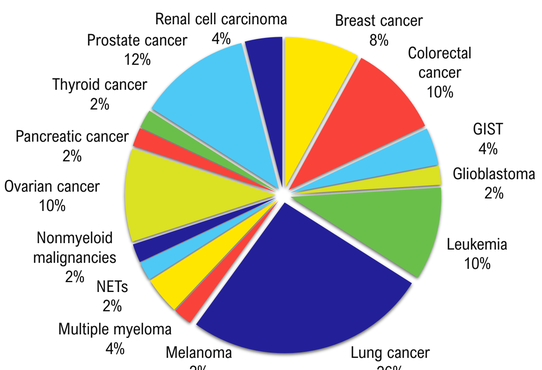


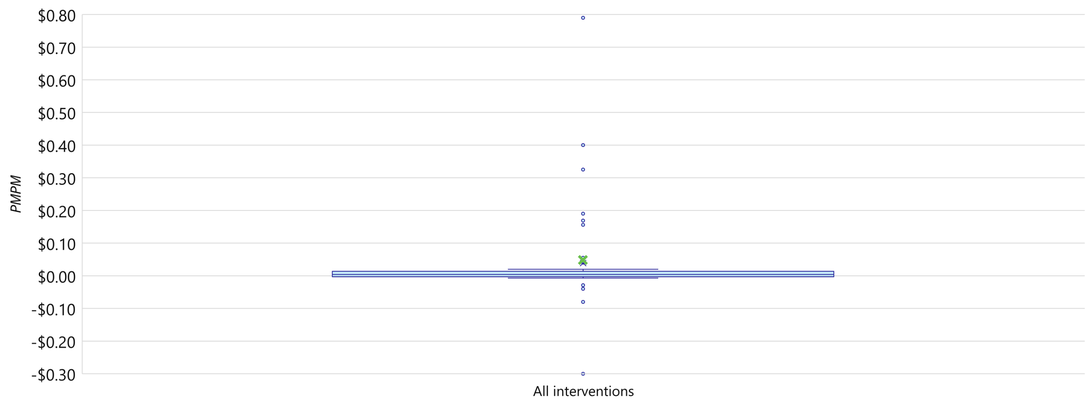
Figure 2b: Malignancy Types of Relevant Studies



PMPM RANGE IN ONCOLOGY

- There is a wide range of reported PMPM values between –$0.3000 and $0.7900 for all tumors and types of interventions. The mean PMPM was $0.0388, and the median was $0.0040.

Figure 3: Range of PMPM in the field of oncology



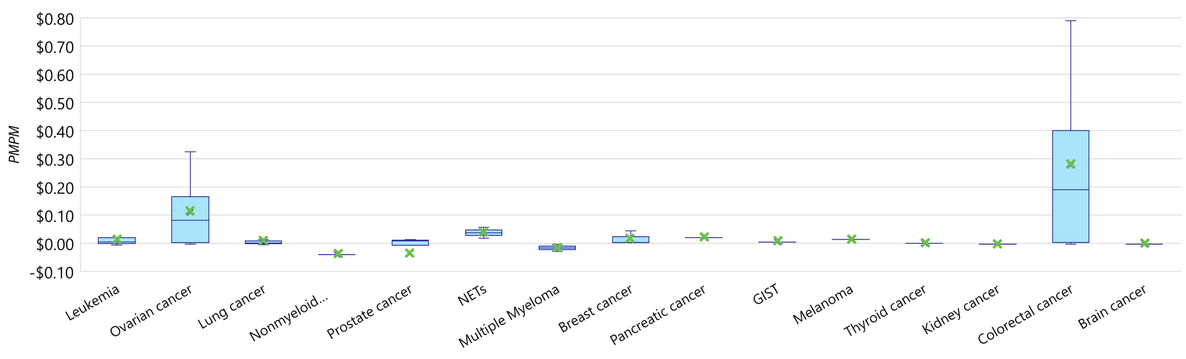
*In all tumors and all interventions; with a time horizon of 1 year; x : mean value

PMPM IMPACTING FACTORS

1) UNDERLYING TUMOR TYPE

- In a 1-year time horizon within the field of oncology, PMPM values ranged between –$0.0800 and $0.7900, with negative values implying savings in costs. The highest variation in incremental PMPM was detected in colorectal cancer and ovarian cancer, and the most savings were reported in prostate cancer.
- For **treatment** interventions only, the mean of reported incremental PMPM values was $0.0235 within a 1-year time horizon. The highest mean incremental PMPM was $0.1091 in ovarian cancer, followed by $0.0375 in NETs, while the lowest was –$0.0165 in multiple myeloma.

Figure 4: PMPM values in different tumor types*

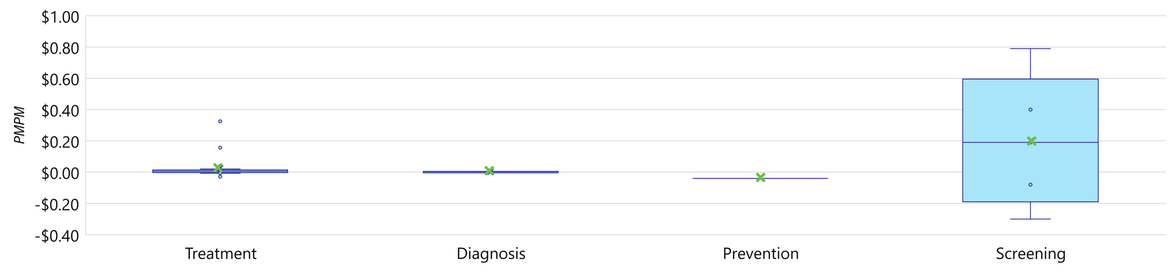


*In all interventions, with a time horizon of 1 year; x : mean value

2) TYPE OF INTERVENTION

- While the mean of PMPM with the intervention of treatment was $0.0235, the mean PMPMs in diagnosis, prevention, and screening were $0.0011, –$0.0400, and $0.2000, respectively.
- A common form of comparison was scenarios with and without a specific intervention. However, in a few budget impact analyses involving PMPM, market shares and diagnostic testing uptake would change in between scenarios, whereas the interventions would remain the same.
- Roth et al (2019) compared different scenarios for colorectal cancer screening (changes in proportion of patients who would be screened for colorectal cancer). With any changes in scenario, incremental PMPM was changed.

Figure 5: PMPM values in different intervention types*



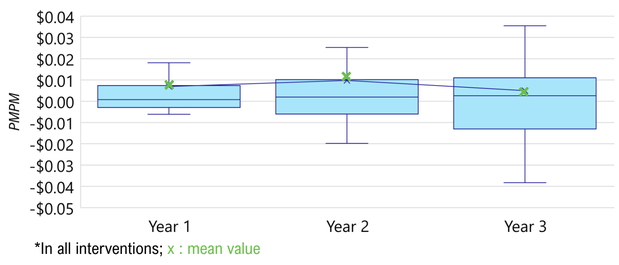
*In all tumors; with a time horizon of 1 year; x : mean value

3) TIME FRAME

- The time frame of calculation can affect PMPM values:

  Eighteen studies reported PMPM values in Year 1, Year 2, and Year 3 in treatment of oncology. The cumulative mean values in these studies show a fluctuating trend from Year 1 ($0.0069) to Year 2 ($0.0098) to Year 3 ($0.0050).

Figure 6: PMPM values through time



*In all interventions; x : mean value

4) PERSPECTIVE

- Several papers provided both Medicare and commercial PMPM values. Medicare incremental PMPM costs were often higher than commercial costs; however, Medicare savings were more than commercial savings. The most frequently used health plan member size was 1,000,000.
- Cai et al (2021), Liu et al (2021), and Yang et al (2021) provided PMPM costs from both Medicare and commercial perspectives in various tumor types, with Medicare costs being higher than commercial costs in Year 1 by $0.011, $0.010, and $0.010, respectively.
- Bloudek et al (2016) reported more PMPM savings in the Medicare plan versus the commercial plan in Year 1 (–$0.029 vs. –$0.004).

Discussion & Recommendations

- **After analyzing the reported PMPMs, an overall lack of proper and cohesive methodology in calculating and reporting final values was identified. A few flaws that were discovered include:**

  1. Using the incorrect definition of PMPM values: per patient per month (PPPM) was switched for PMPM in a few studies, resulting in a higher final value since PPPM reflects the final cost per patient instead of the final cost per member (patients and non-patients).
  2. Not reporting the timeframe of PMPM values: some studies did not clearly provide a timeframe or reported yearly values sporadically, which weakens the comparability of the data.
  3. Differences among perspectives: studies had a variety of perspectives including commercial plans, Medicare, or a combination of the two, which resulted in variability across studies for similar interventions.

PMPM values cannot be properly assessed without context; therefore, the protocol on reporting should be standardized by specifying each of the following factors, in addition to the value of PMPM:

1. **Underlying disease**
2. **Type of intervention/comparator**
3. **Perspective**
4. **Timeframe**

Moreover, the numerator and denominator of a PMPM value should be clearly specified, such as instances when values are extracted from a database or when the intervention targets a specific gender or age group.

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