A Systematic Review of Productivity Gain/Loss in Health Economic Evaluations: An Element for Value Assessment of Innovative Treatments

EE557

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Background

In health economic evaluations, it is important to take into account the impact of health conditions on the workforce, which may affect the quantity (e.g. time) and quality (e.g. skills and concentration) of the work.[1] Productivity costs comprise of the costs associated with loss of productivity related to disease, disability, or death.[2] Productivity costs also feature as a component of the ISPOR value flower.[3]

Estimating productivity costs is a complex topic. While most productivity can be calculated utilising various patient-reported outcomes (PRO) questionnaires, the use of these instruments is inconsistent. Inconsistency also exists for the valuation and calculation methods of the monetary outcomes of the lost productivity.

Objective

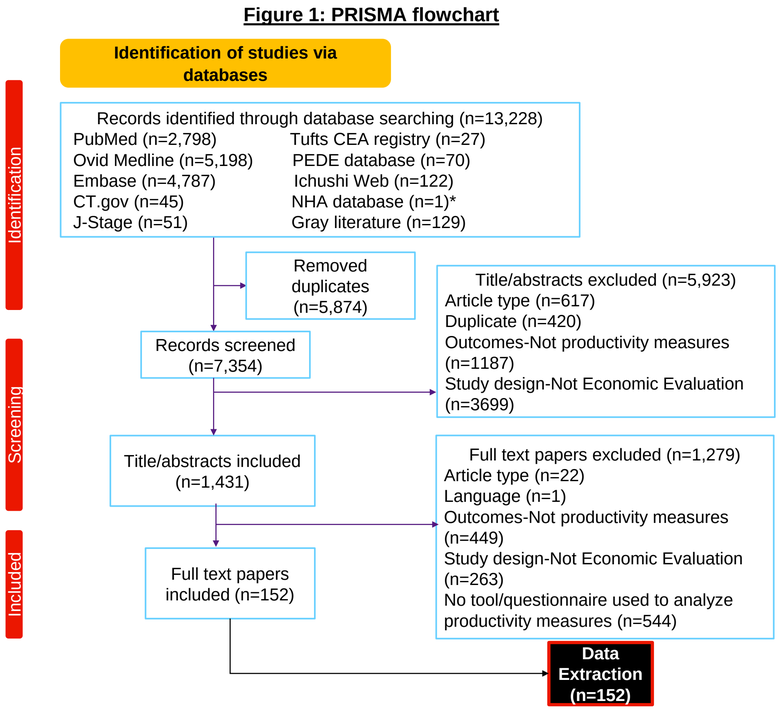
Productivity is utilised inconsistently in value assessment and pose methodological and conceptual barriers for estimation. This review aimed to examine how productivity gain/loss assessments are utilized in patients and caregivers in health economic evaluations and to identify methodological gaps.

Methods

We conducted a SLR as per methodology described by Cochrane[4] and following the PRISMA guidelines[5] and utilizing PubMed, Ovid MEDLINE, Embase, Japanese databases (J-STAGE and Ichushi Web), and economic literature databases Cost-Effectiveness Analysis (CEA) Registry, Paediatric Economic Database Evaluation (PEDE), and National Health Service Economic Evaluation Database (NHS EED)). Additional relevant data were identified using clinical trial registries and grey literature searches.
Studies published between January 2021 and December 2023 which presented economic evaluations were included.

Results

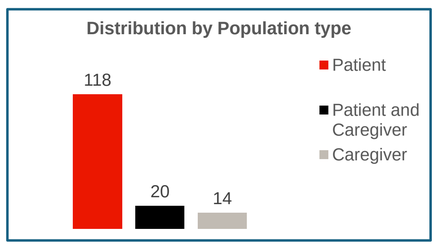
Figure 1: PRISMA flowchart



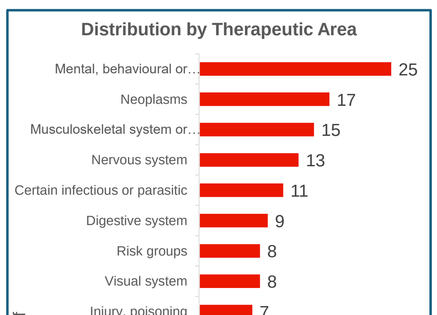
A total of 152 studies published since 2021 were included in this review. The distribution of the selected studies shows increasing trend between 2021-2023. Articles published in 2023 took the highest place with 54 publications (35.5%) followed by 2021 publications- 50 (32.9%) and 2022 publications- 48 (31.6%).

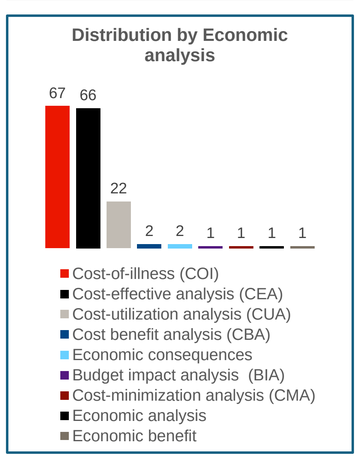
Figure 2: Study characteristics

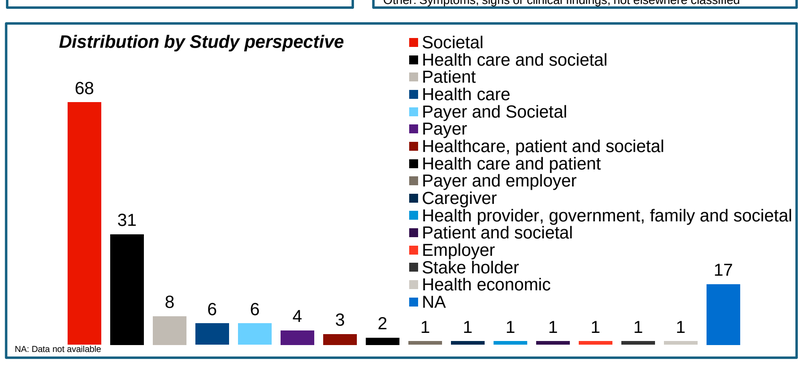
Publication year	No. of studies (N)	% studies
2023	54	35.5
2021	50	32.9
2022	48	31.6



Region	No. of studies (N)	% studies
Europe	73	48
Asia	40	26.3
North America	22	14.5
LATAM	3	2
Others*	14	9.2





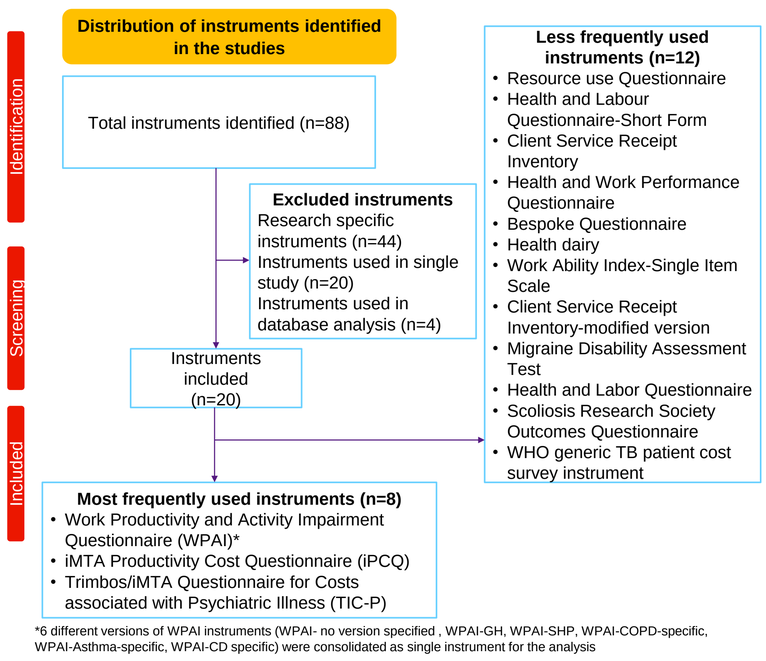


Results (Contd)

Instruments

88 instruments which are used to assess the productivity measures were identified. Instruments that were research-specific questionnaires, used in a single study, and used in database analysis were excluded.

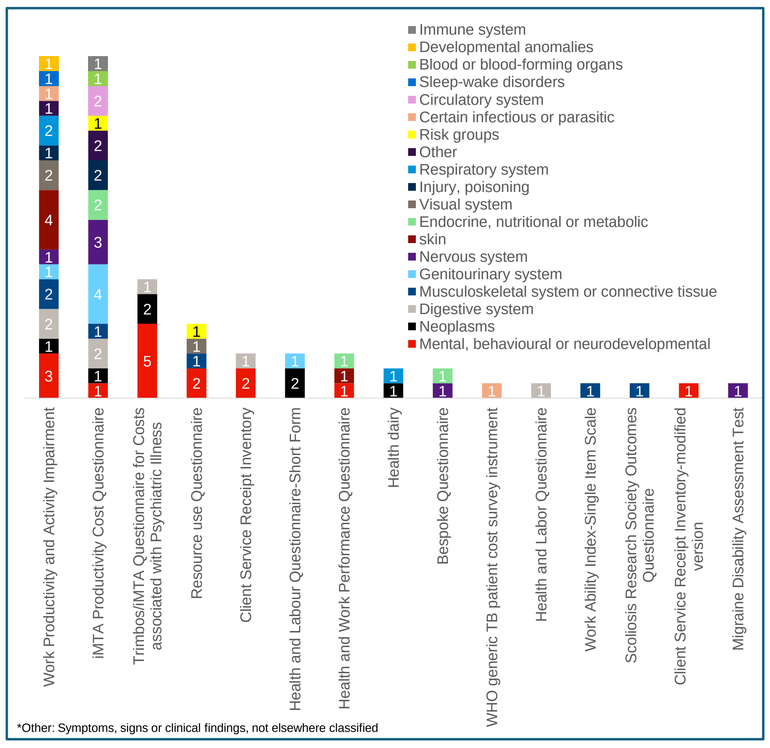
Figure 3: Selection of instruments



*6 different versions of WPAI instruments (WPAI- no version specified , WPAI-GH, WPAI-SHP, WPAI-COPD-specific, WPAI-Asthma-specific, WPAI-CD specific) were consolidated as single instrument for the analysis

iMTA Productivity Cost Questionnaire (IPCQ)- 23 (15.1%); Work Productivity and Activity Impairment Questionnaire (WPAI)- 23 (15.1%)- [WPAI- no version specified- 8 (11.8%); WPAI-GH- 6 (3.9%); WPAI-SHP-6 (3.9%); Work Productivity and Activity Impairment: COPD-specific, Asthma-specific, CD specific- each 1 (0.7%)]; Trimbos/iMTA Questionnaire for Costs associated with Psychiatric Illness (TIC-P)- 8 (5.3%); Resource use Questionnaire (RUQ)- 5 (3.3%) were the most used instruments. More than half of the instruments were only used once. TIC-P is widely used in patients with Mental, behavioural or neurodevelopmental disorders. iPCQ is not used in patients with Mental, behavioural or neurodevelopmental disorders, iPCQ is the only instrument used in patients with Diseases of the circulatory system. WPAI is mostly used instrument in patients with Diseases of the skin.

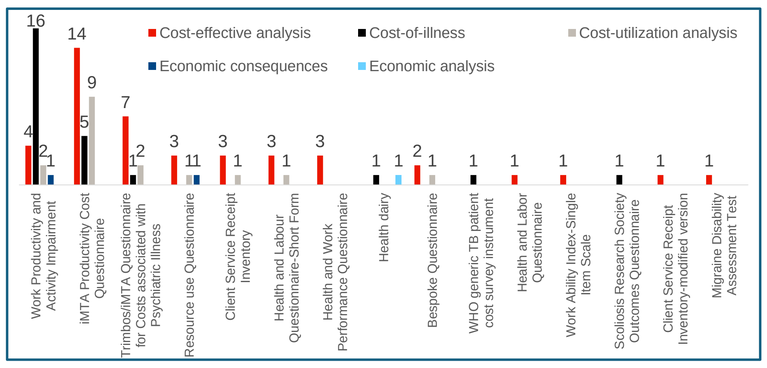
Figure 4: Distribution of shortlisted instruments by Therapeutic area



*Other: Symptoms, signs or clinical findings, not elsewhere classified

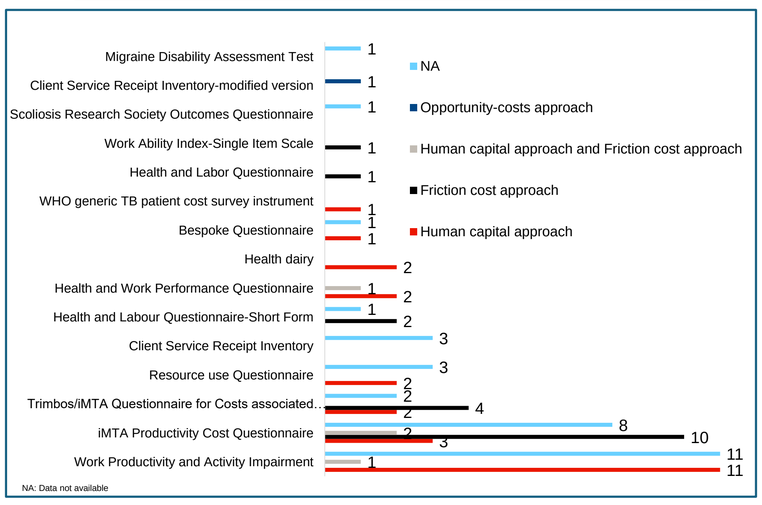
WPAI (any version) is mostly utilized in COI (16- 20.5% studies)
iPCQ and TIC-P are mostly utilized in CEA (14- 17.9% studies and 7- 9% respectively); iPCQ is also utilized in CUA (9- 11.5% studies).

Figure 5: Distribution of shortlisted instruments by economic analysis



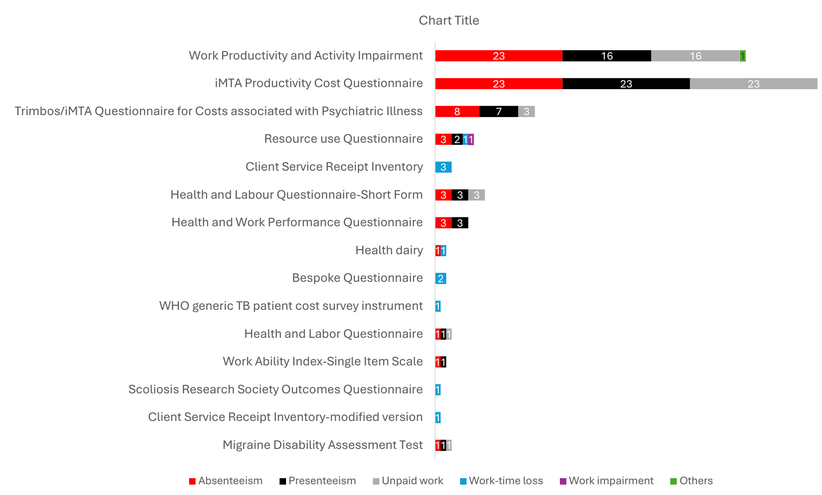
WPAI is adopted in all age groups, iPCQ is adopted in both adults and elderly participants and TIC-P is widely used in Adults.
Human capital approach is the most utilized method for valuation for the instruments.
WPAI AND iPCQ are mostly administered in patients. WPAI is also administered to caregivers in 4 studies. WPAI can be customized for both patients and caregivers.

Figure 6: Distribution of shortlisted instruments by valuation method



Results (Contd)

Figure 7: Distribution of shortlisted instruments by use of productivity component



Absenteeism and Presenteeism are used across all the instruments. Absenteeism, Presenteeism and unpaid work are the important productivity components for WPAI, iPCQ, TIC-P and Health and Labour Questionnaire (HLQ).
Various forms of hourly wages were utilised as a labour measure in 29 studies, while daily wages were used in 19 studies. Weekly, monthly, and annual wages were also considered as labour measures. Most of the instruments (WPAI, iPCQ and TIC-P) used hourly wages as the Labor measure for evaluating the productivity loss
Daily wages is also used by iPCQ and TIC-P. The recall period for WPAI is seven days, for iPCQ is four weeks and for TIC-P is three months. All three most commonly used instruments are reliable.
All 3 major instruments were found to be reliable and valid.

Table 1: labor measure and validity of instruments

Instrument Name	Productivity components	Recall period	Validity	Reliability	Labor measures	Focus of application
Work and Productivity, Activity, Impairment Questionnaire- (General Health/Specific Health/No version specified) (*WPAI*)	Absenteeism, presenteeism, overall work impairment and daily activity impairment	7 days	Yes	Yes	Hourly wages	Generic/Specific Health
iMTA Productivity Cost Questionnaire (*IPCQ)*	To calculate productivity costs, 8 core items are used. The value of absenteeism is calculated from items 2, 3, 4, and 6; presenteeism from items 2, 3, 8, and 9; and unpaid work productivity loss from items 11 and 12	4 weeks	Yes	Yes	The costs of productivity loss are evaluated in hours as hourly wages	Generic
Trimbos/iMTA Questionnaire for Costs associated with Psychiatric Illness (*TIC-P*)	Absenteeism, presenteeism, and unpaid work	3 months	Yes	Yes	The costs of productivity loss are evaluated as hourly or daily wages	Generic Mental health
Resource use Questionnaire (*RUQ)*	Absenteeism and presenteeism	NA	NA	NA	Average wage	Generic
Health and Labour Questionnaire-Short Form (*HLQ-SF)*	Absenteeism, presenteeism, and unpaid work	1 month	NA	NA	Wage	Generic
Client Service Receipt Inventory (*CSRI)*	Work-time loss	NA	Yes	NA	Average wage	Generic
Health and Work Performance Questionnaire (*HPQ)*	Absenteeism and presenteeism	7 days	Yes	NA	Average wage	Generic
Bespoke Questionnaire	Work-time loss	NA	NA	NA	NA	Generic
Health dairy	Work-time loss and absenteeism	NA	NA	NA	Average wage	Generic
Work Ability Index-Single Item Scale (*WAS)*	Absenteeism, and presenteeism	NA	Yes	NA	NA	NA
Client Service Receipt Inventory-modified version 8 (*CSRI-m*)	Work-time loss	3 months	Yes	NA	National average wage	Generic
Migraine Disability Assessment Test	Absenteeism, presenteeism, and unpaid work	3 months	Yes	NA	Daily wages	Disease specific
Health and Labor Questionnaire (*HLQ)*	Absenteeism, presenteeism, and unpaid work	NA	Yes	NA	Average hourly wage	Generic
Scoliosis Research Society Outcomes Questionnaire (*SRS)*	Work-time loss	NA	Yes	NA	Loss of average weekly earnings and average weekly income	Generic
WHO generic TB patient cost survey instrument	Work-time loss	NA	Yes	NA	Hourly wage	Disease specific

Conclusion

This review identified a significant quantity and grow trend of health economic evaluations employing productivity measures between 2021 and 2023. Various instruments were used to measure productivity loss in these studies, with a few being commonly utilized across studies. A standard approach should be established to make sure that productivity gain/loss is captured consistently in value assessment for innovative therapies.

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