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How are clinicians' acceptance and use of clinical decision support systems evaluated over time? A systematic review

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Acknowledgement of Country

I acknowledge the Gadigal people, the Traditional Custodians of the land on which we meet and pay my respects to their Elders past and present. I extend that respect to Aboriginal and Torres Strait Islander peoples here today.



What is a Clinical Decision Support System?

- A **Clinical Decision Support (CDS) system** is any electronic system that "enhances health-related decisions and actions with pertinent, organized clinical knowledge and patient information to improve health and healthcare delivery"¹
- **Includes** alerts and reminders, order sets, dashboards, risk calculators, documentation templates, clinical workflow tools and **more**
- CDS has the potential to greatly improve patient care



Do CDS Systems Improve Care in Practice?

CDS can improve care, but is dependent on clinicians' **acceptance and use** of the system

Clinician acceptance

- Usability
- Workflow fit
- Usefulness
- etc...⁴

System use

- Providers **used CDS** on average in **34.2%** of eligible encounters³

Process of care

- CDS increased the proportion of patients receiving the desired care by **5.8%**²

² Kwan J L, et al. (2020). "Computerised clinical decision support systems and absolute improvements in care: meta-analysis of controlled clinical trials" *BMJ*; 370 :m3216

³ Kouri, A., et al. (2022). "Do providers use computerized clinical decision support systems? A systematic review and meta-regression of clinical decision support uptake." *Implement Sci* 17(1): 21.

⁴ Kilsdonk, E., et al. (2017). "Factors influencing implementation success of guideline-based clinical decision support systems: A systematic review and gaps analysis." *Int J Med Inform* 98: 56-64.

What does this work add?



Current reviews examine acceptance and use of CDS in a **static** nature



User familiarity with systems develops over time



Systems become increasingly adapted and engrained into the local environment over time



Comprehensive, nuanced approach that addresses clinicians' needs at different points in time

Aims

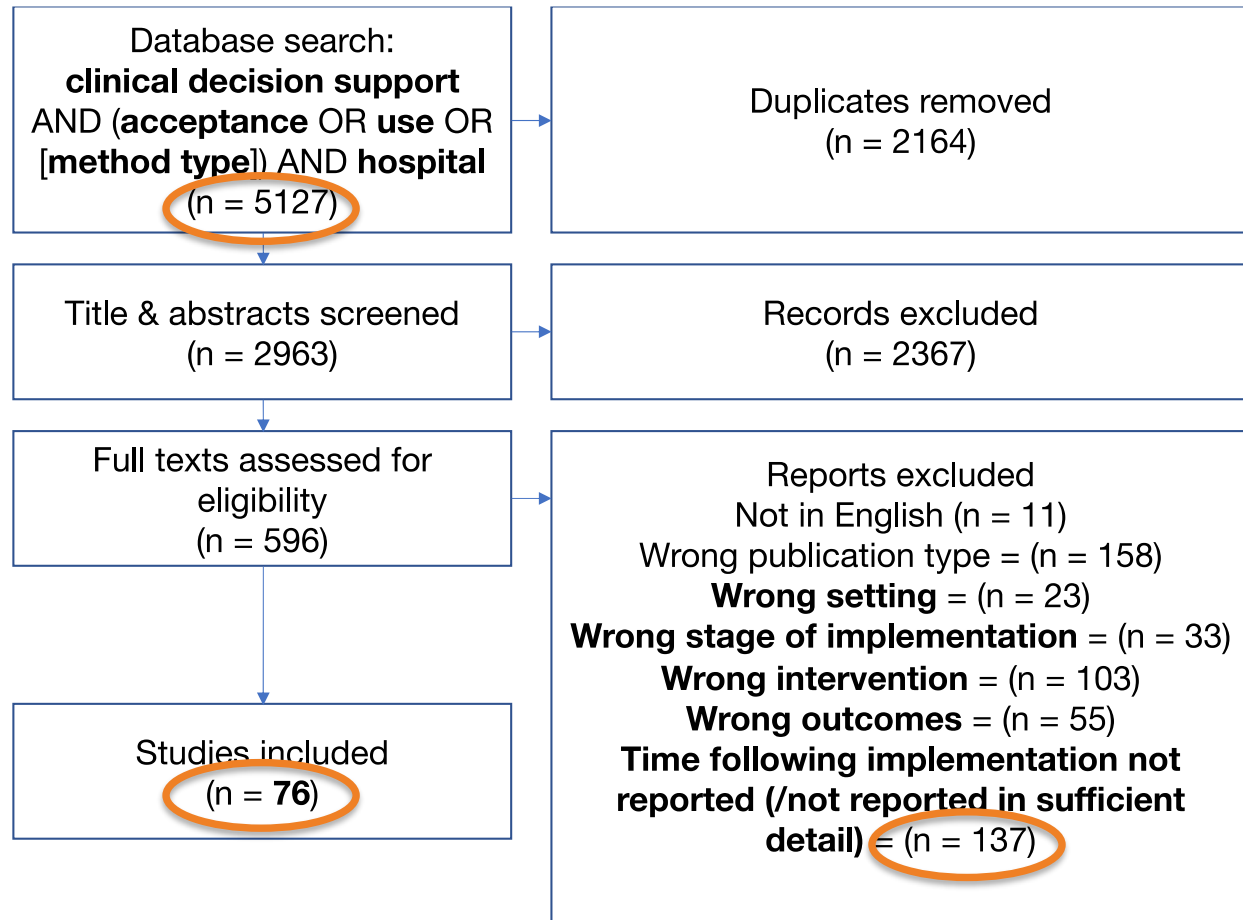
Systematic review of studies evaluating CDS acceptance and use post-implementation in hospitals:

- To explore how clinicians' acceptance and use of CDS in hospitals was **evaluated over time**
 - Highlight trends
 - Highlight gaps

Methods

- Included studies evaluated clinicians' **acceptance and/or use** of a CDS system **integrated** with a clinical information system in a **hospital** setting and reported the **timeframe** that data was collected in relation to implementation
 - E.g. *'interviews were conducted 8 months following CDS implementation', 'data were collected in November 2020... CDS was implemented in June 2020'*
- Data extracted included:
 - Study identifiers
 - Methods used
 - Timeframe of data collection in relation to implementation

Results



Methods Used (n=76)

Typically using CIS data,
compliance rates



Clinicians' experiences with CDS, but
often with limited reporting in papers
(used in combination or with other
outcomes reported)



System Data	Questionnaire	Interviews	Focus groups	Observations
35	34	19	12	7

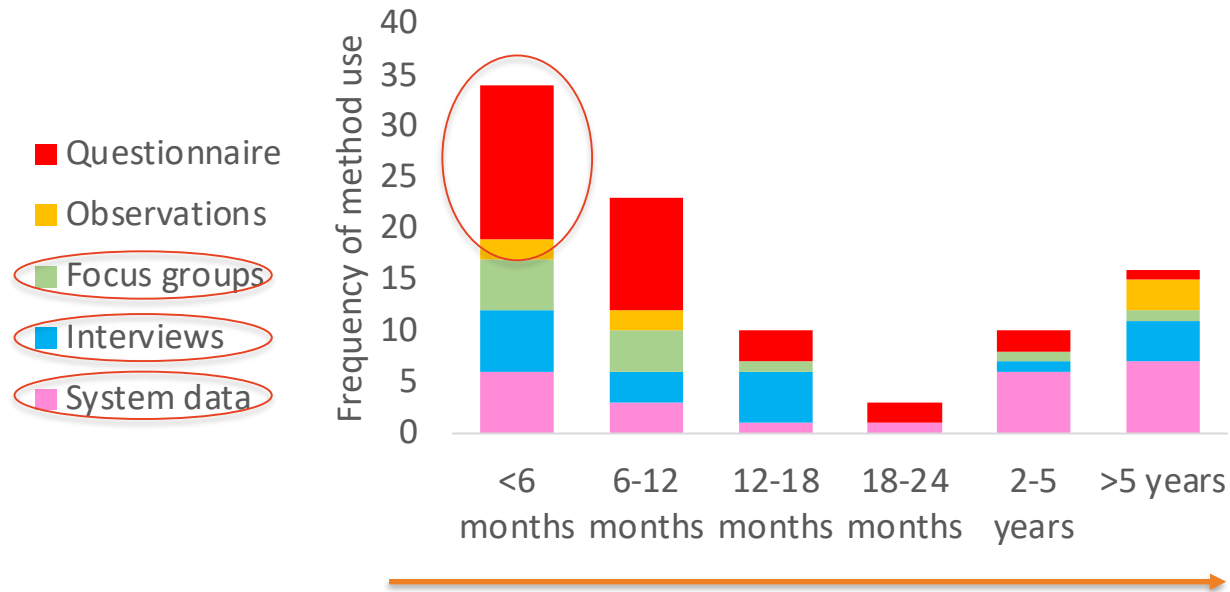


Quantitative or short free text
responses, based on existing
frameworks or targeted to
specific CDS outcomes



Mostly quantitative and
always used in combination
with another method

Methods Used Over Time (n=65*)

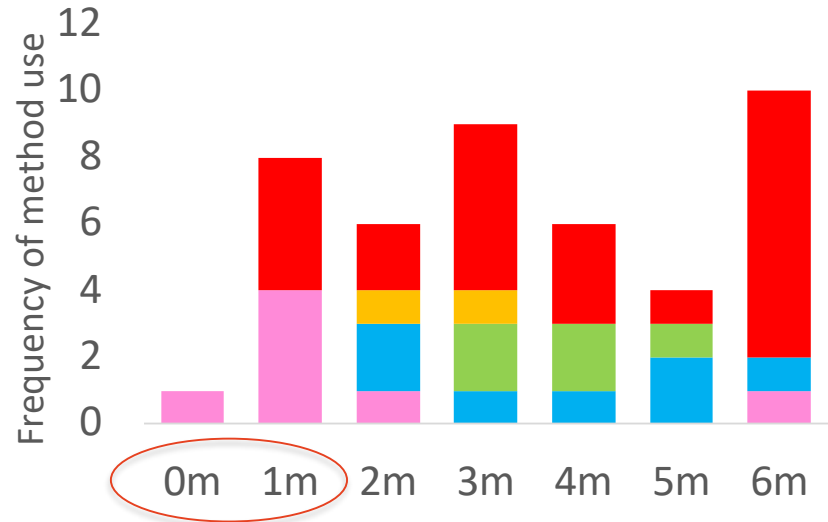


*+11 studies analysing system data across multiple timeframes

Methods Used Within First 6 Months Following Implementation (n = 29)

Critical time for success⁵

- Initial perceptions are formed
- Users abandon systems
- Dips in performance occur



Conclusions and Recommendations



Poor reporting of time

Enhanced reporting of timeframes in relation to CDS implementation is needed



Observations not frequently conducted

Explore using observations to understand nuanced interactions with CDS over time



Analysis of system data limited to compliance measures

Explore additional measures when analysing system data



Lack of qualitative research

In-depth qualitative research is needed, both during the early phases of implementation ('shakedown') and long-term

Thank you!

PhD supervisors and co-authors



Prof. Melissa Baysari



Dr. Adeola Bamgboje-Ayodele

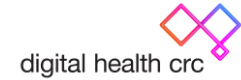


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Project partners and funders



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