



October 2016 – SUPPORT Summary of a systematic review

Do decision support and clinical information systems improve the healthcare process and health outcomes for people living with HIV?

The overall number of people living with HIV has steadily increased, as HIV treatments extend life. As HIV infection is shifting mostly to a chronic disease managed primarily in the ambulatory setting, chronic disease management interventions such as decision support and clinical information systems might be useful to this population.

Key messages

- **Decision support may improve adherence to recommended practice by health professionals and adherence to treatment by patients. It is uncertain if it improves health outcomes or healthcare utilisation.**
- **Clinical information systems probably increase the proportion of patients with a suppressed HIV load, and may increase adherence to recommended practice by health professionals and adherence to treatment by patients. It is uncertain whether they improve healthcare utilisation.**
- **Combinations of decision support and clinical information systems may improve adherence to recommended practice by health professionals and adherence to treatment by patients. It is uncertain if they change at-risk behaviours, health outcomes, or healthcare utilisation.**
- **Few studies were conducted in low-income countries.**



Who is this summary for?

People deciding whether to introduce decision support and clinical information systems for people living with HIV

! This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low-income countries

X Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

This summary is based on the following systematic review:

Pasricha A, Deinstadt RT, Moher D, et al. Chronic care model decision support and clinical information systems interventions for people living with HIV: a systematic review. *J Gen Intern Med* 2013; 28:127-35.

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

SUPPORT was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

Glossary of terms used in this report:
www.supportsummaries.org/glossary-of-terms

Background references on this topic:
See back page

Background

As HIV infection becomes a chronic disease, it is important to understand how the principles of chronic disease management could be applied to this population. Strategies for improving management of chronic diseases (within the Chronic Care Model) include: decision support interventions (such as the distribution of educational materials, use of clinical practice guidelines, and case discussions) and clinical information system interventions (based on establishing information systems to organize patient data in order to improve the delivery of care, such as by developing schedules of patients with certain conditions, audit and feedback, change in medical records systems, and providing reminders).

How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low-income countries. The methods used to assess the reliability of the review and to make judgements about its relevance are described here: www.supportsummaries.org/how-support-summaries-are-prepared/

Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

About the systematic review underlying this summary

Review objective: To assess the effectiveness of decision support (DS) and clinical information system (CIS) interventions for people living with HIV

Types of	What the review authors searched for	What the review authors found
Study designs & Interventions	Comparative studies that examined the impact of DS and CIS interventions compared to usual care, another (non-Chronic Care Model) intervention, or both	16 studies were included in the review: 2 randomized trials, 1 non-randomized trial, 4 prospective and 5 retrospective cohorts, 1 cross-sectional study, 2 time series, and 1 prospective time-motion study.
Participants	Healthcare providers caring for individuals known to be living with HIV	Ambulatory patients. Participants in 1 study were children and the rest were adults (mostly men under 50 years).
Settings	Ambulatory setting	USA (10 studies), UK (1), France (1), Switzerland (1), South Africa (1), Zambia (1) and Uganda (1)
Outcomes	1) Immunologic or virologic outcomes such as CD4 count or viral load; 2) medical outcomes such as mortality, progression to AIDS, opportunistic infections, adherence to medication, and risk behaviours; 3) psychosocial outcomes such as quality of life or psychological health and well-being; 5) economic outcomes such as healthcare utilization (length of stay, visits), costs; and 6) healthcare process/provider performance outcomes	Process and health outcome measures

Date of most recent search: February 2011

Limitations: This is a well-conducted systematic review with only minor limitations.

Pasricha A, Deinstadt RT, Moher D, et al. Chronic care model decision support and clinical information systems interventions for people living with HIV: a systematic review. J Gen Intern Med 2013; 28:127-35.

Summary of findings

Sixteen studies were included in the review.

1) Decision support systems

Four studies reported nine process measures and 12 health outcome measures.

- It is uncertain if decision support systems improve health outcomes or health care utilization. The certainty of this evidence is very low.
- Decision support may improve adherence to recommended practice by health professionals and adherence to treatment by patients. The certainty of this evidence is low.

About the certainty of the evidence (GRADE) *

⊕⊕⊕⊕

High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕○

Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.

⊕⊕○○

Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕○○○

Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

* This is sometimes referred to as 'quality of evidence' or 'confidence in the estimate'.

† Substantially different = a large enough difference that it might affect a decision

See last page for more information.

Decision support		
People	Healthcare providers caring for individuals known to be living with HIV	
Settings	Ambulatory	
Intervention	Decision support	
Comparison	Usual care, another (non- Chronic Care Model) intervention, or both	
Outcomes	Impact	Certainty of the evidence (GRADE)
Health outcomes	The proportion of patients with <HIV 75 copies/ml increased 33% in one study. Remission (6 months follow-up): odds ratio 2.40 (95% CI 1.10-5.22) and at 12 months 1.36 (0.66-2.88)	⊕○○○ Very low
Healthcare utilization	Mean reductions for the total visit time (11.5 minutes, p<0.001), the time spent in direct patient care (2.9 vs. 2.3 min/visit, p<0.001), and the time spent in indirect patient care (3.2 vs. 2.9 min/visit, p=0.7)	⊕○○○ Very low
Process outcomes	The median increase in adherence to recommended practice or adherence to treatment was 13% (ranging from 0% to 43%).	⊕⊕○○ Low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

2) Clinical information systems

Nine studies evaluated clinical information systems: two examined reminders, two audit and feedback, two examined presence of quality monitoring, and three studies examined both reminders and changes in medical records systems. Eight studies assessed 41 process measures. Three studies (two randomized trials) assessed nine health outcomes.

- ➔ **Clinical information systems probably increase the proportion of patients with a suppressed HIV load. The certainty of this evidence is moderate.**
- ➔ **Clinical information systems may improve adherence to recommended practices by health professionals and treatments by patients. The certainty of this evidence is low.**

Clinical information systems		
People	Healthcare providers caring for individuals known to be living with HIV	
Settings	Ambulatory	
Intervention	Clinical information systems	
Comparison	Usual care, another (non- Chronic Care Model) intervention, or both	
Outcomes	Impact	Certainty of the evidence (GRADE)
Health outcomes	The median proportion of patients with a suppressed HIV load increased by 9% (ranging from 6% to 13%).	⊕⊕⊕○ Moderate
Process outcomes	The median increase in adherence to recommended practice or adherence to treatment was 9% (ranging from a reduction of 3% to an increase of 71%)	⊕⊕○○ Low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

3) Decision support and clinical information systems

Combinations of decision support and clinical information systems were evaluated in three studies.

- ➔ It is uncertain whether combinations of decision support and clinical information systems change at-risk behaviours. The certainty of this evidence is very low.
- ➔ Combinations of decision support and clinical information systems may increase adherence to recommended practice by health professionals and adherence to treatment by patients. The certainty of this evidence is low.

Decision support and clinical information systems		
People	Healthcare providers caring for individuals known to be living with HIV	
Settings	Ambulatory	
Intervention	Decision support and clinical information systems	
Comparison	Usual care, another (non- Chronic Care Model) intervention, or both	
Outcomes	Impact	Certainty of the evidence (GRADE)
Change in at-risk behaviors	Occurrence of anal or vaginal intercourse without a condom in the past 3 months decreased from 42% to 23% during follow-up ($p<0.0001$).	⊕○○○ Very low
Process outcomes	The median increase in adherence to recommended practice or adherence to treatment was 9% (ranging from 1% to 50%)	⊕⊕○○ Low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

Relevance of the review for low-income countries

→ Findings	▷ Interpretation*
APPLICABILITY	
→ 13 studies included in the systematic review were conducted in high-income countries, 1 in a middle-income country and 2 in low-income countries.	▷ When assessing the transferability of these findings to low-income countries the following factors should be considered: – The availability of human and technical resources – The acceptability and costs of the interventions
EQUITY	
→ Equity indicators were poorly reported overall. When reported, these indicators did not provide any significant insights into populations for which the interventions were more or less effective compared to others.	▷ Resources needed for decision support and clinical information systems may be less available in disadvantaged settings. Decision support and clinical information systems may increase inequity if they are not available to these populations.
ECONOMIC CONSIDERATIONS	
→ The systematic review found scarce data about resource utilization.	▷ Scaling up many of the interventions may require substantial resources, which should be considered. ▷ Local costings should be undertaken, in settings differing from the original investigations.
MONITORING & EVALUATION	
→ The certainty of the evidence is low or very low, or no evidence was found for all of the comparisons and outcomes.	▷ More rigorous studies are required to determine the effects and the cost-effectiveness of decision support and clinical information systems, particularly in resource-poor settings.

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made see: www.supportsummaries.org/methods

Additional information

Related literature

Oluoch T, Santas X, Kwaro D, et al. The effect of electronic medical record-based clinical decision support on HIV care in resource-constrained settings: a systematic review. *International Journal of Medical Informatics* 2012; 81(10):e83–92.

Main C, Moxham T, Wyatt JC, et al. Computerised decision support systems in order communication for diagnostic, screening or monitoring test ordering: systematic reviews of the effects and cost-effectiveness of systems. *Health Technology Assessment* 2010; 14(48):1–227.

Rackal JM, Tynan AM, Handford CD, et al. Provider training and experience for people living with HIV/AIDS. *The Cochrane Database of Systematic Reviews* 2011; (6):CD003938.

Brinkhof MW, Pujades-Rodriguez M, Egger M. Mortality of patients lost to follow-up in antiretroviral treatment programmes in resource-limited settings: systematic review and meta-analysis. *PloS One* 2009; 4(6):e5790.

This summary was prepared by

Agustín Ciapponi, Instituto de Efectividad Clínica y Sanitaria, Buenos Aires, Argentina

Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

Acknowledgements

This summary has been peer reviewed by: Heiner C. Bucher and Claire Kendall.

This review should be cited as

Pasricha A, Deinstadt RT, Moher D, et al. Chronic care model decision support and clinical information systems interventions for people living with HIV: a systematic review. *J Gen Intern Med* 2013; 28:127–35.

The summary should be cited as

Ciapponi A. Do decision support and clinical information systems improve the healthcare process and health outcomes of people living with HIV? A SUPPORT Summary of a systematic review. October 2016. www.supportsummaries.org

About certainty of the evidence (GRADE)

The “certainty of the evidence” is an assessment of how good an indication the research provides of the likely effect; i.e. the likelihood that the effect will be substantially different from what the research found. By “substantially different” we mean a large enough difference that it might affect a decision. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the study design (randomised trials versus observational studies), factors that reduce the certainty (risk of bias, inconsistency, indirectness, imprecision, and publication bias) and factors that increase the certainty (a large effect, a dose response relationship, and plausible confounding). For each outcome, the certainty of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

For more information about GRADE: www.supportsummaries.org/grade

SUPPORT collaborators:

The Cochrane Effective Practice and Organisation of Care Group (EPOC) is part of the [Cochrane Collaboration](http://www.cochrane.org). The Norwegian EPOC satellite supports the production of Cochrane reviews relevant to health systems in low- and middle-income countries. www.epocoslo.cochrane.org

The Evidence-Informed Policy Network (EVIPNet) is an initiative to promote the use of health research in policymaking in low- and middle-income countries. www.evipnet.org

The Alliance for Health Policy and Systems Research (HPSR) is an international collaboration that promotes the generation and use of health policy and systems research in low- and middle-income countries. www.who.int/alliance-hpsr

Norad, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. www.norad.no

The Effective Health Care Research Consortium is an international partnership that prepares Cochrane reviews relevant to low-income countries. www.evidence4health.org

To receive e-mail notices of new SUPPORT summaries or provide feedback on this summary, go to: www.supportsummaries.org/contact