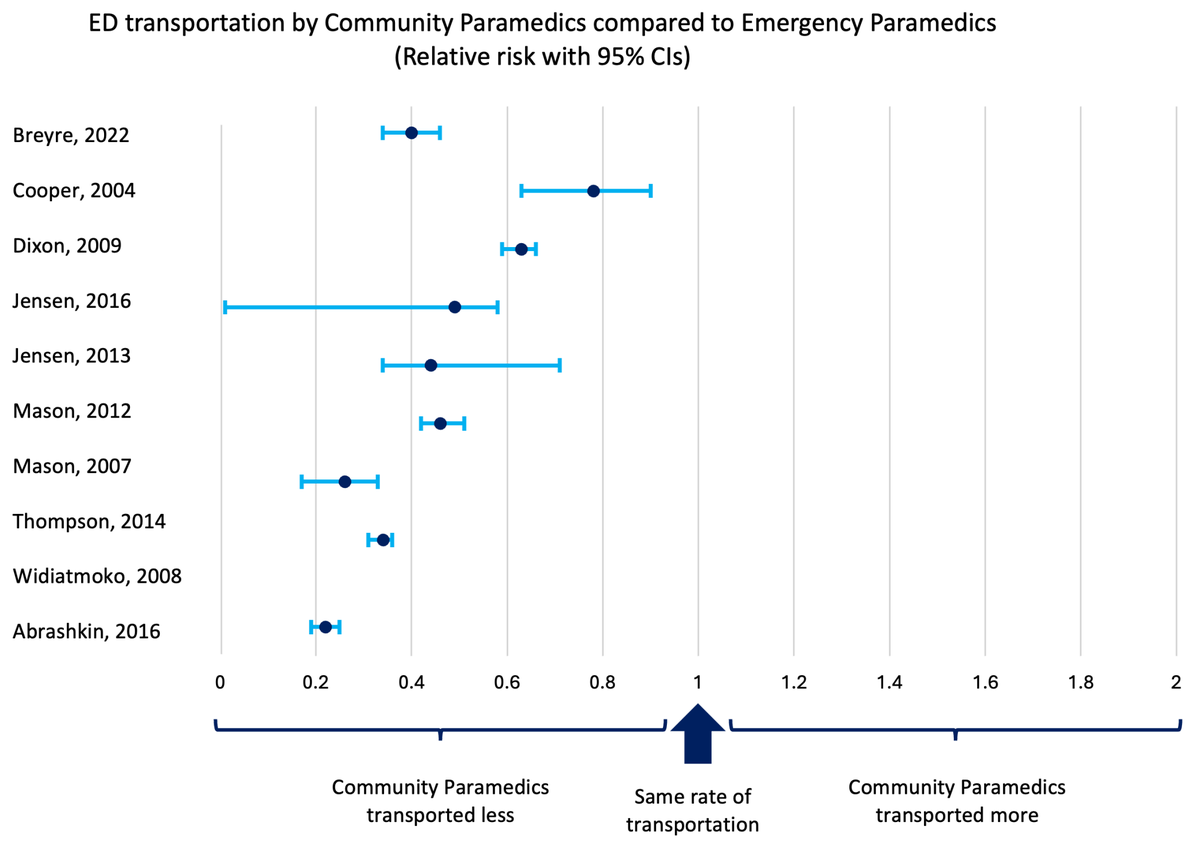
Low quality evidence suggests that Community Paramedics within emergency services appear to save the healthcare system $338-$1,227 per attendance

‘A systematic review of the effect of community paramedic models within emergency medical services on economics and efficiency’

Background
Non-emergency pathologies increasingly dominate emergency medical service (EMS) requests. One mechanism to address this are Community Paramedics working reactively within EMS, and since their inception 20 years ago these models have been introduced globally. Despite their widespread experimentation, no research currently exists synthesising the impact of these roles within EMS on economics and efficiency.

Method
An appropriately multidisciplinary team was formed (health economics, paramedicine, medicine, nursing). The protocol was registered on PROSPERO and published open access. A three-stage systematic search was performed, a PRESS completed, and PRISMA complied with. Five databases were systematically searched: Cochrane CENTRAL, Embase, MEDLINE, CINAHL, and Scopus. Identified studies were assessed for inclusion and quality by two independent investigators using JBI tools. 51 unique characteristics were extracted for each study and verified by two reviewers, costs inflated and converted, and outcomes synthesised with comparisons by model, population, clinician education level, and reliability of findings.

Results
Eleven studies (n=7,136 intervention group) met criteria. These included one economic evaluation (cost-utility analysis, Quality Adjusted Life Years using EQ-5D, UK time trade-off tariff), four costing studies, and six cohort or before-after studies. Quality was moderate. Models included autonomous paramedics (6 studies, n=4,132), physician oversight (3 studies, n=932), and/or special populations (5 studies, n=3,004). 21 outcomes were reported. Models unanimously reduced ED transportation (by 14-78%; higher quality studies 50-54%, n=2,639, significant), costs were reduced by $338-1,227 AUD 2023 per attendance in four studies (n=2,962), and one study performed economic evaluation (n=1,549), finding the intervention dominated with a >95% chance of the model being cost-effective.



Conclusion
Low quality evidence suggests that these models reduce system costs. Moderate quality evidence suggests that these models reduce ED transportation by a rate that was beneficial but also highly variable, and that this reduction in turn leads to net healthcare system savings provided a minimum threshold of demand is met. Due to heterogeneity in models (including paramedic education, the population eligible for the intervention, and the geographic areas they service), the generalizability of outcomes must be regarded with caution.

Recommendations for practice
- If a local population routinely has 3+ low acuity presentations per shift, consider trialling a Community Paramedic in the area and assessing impact.
- Models may nonetheless be desirable with lower presentations in rural locations for ethical reasons.
- Tailor Community Paramedic population and scope to local needs.
- A Community Paramedic will increase costs to the ambulance, but save costs downstream from reduced ED presentations (leading to a net benefit); consider approaching hospitals and government to seek co-funding that appropriately reflects this cost shifting.

Outcome	Direction of finding	Reliability of finding	Summary (population, number of patients in intervention arm)
Cost-utility	✓	×	Single study found >95% chance of cost-effectiveness (population: patients aged >60, n=1,549)
Cost	✓	?	Four studies all found healthcare system savings (population: all EMS callers, n=2,962)
ED transportation rate	✓	✓	All studies unanimously found a reduction in ED transportation rate of 14% - 78% (population: all patients, all subgroups, n=7,136)
Patient ED length of stay	✓	×	Two studies found a reduction of 1.5-2 hours (population: patients aged >60 or RACF residents, n=1,677)
24-hour EMS re-presentation rate	✓	×	One study found a 25% decrease (population: all EMS callers, n=170)
48-hour EMS re-presentation rate	?	×	One study found a minor increase, one a minor decrease (population: RACF residents, n=268)
28-day EMS re-presentation rate	?	×	One study found no difference (population: all EMS callers, n=125)
28-day ED re-presentation rate	✓	×	One study found a 25% decrease (population: patients aged >60, n=1,549)
28-day admission rate	✓	×	One study found a 6% decrease (population: patients aged >60, n=1,549)
28-day mortality rate	?	×	One study found no difference (population: patients aged >60, n=1,549)

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