What is the Potential of Community Paramedicine to Fill Rural Health Care Gaps?

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Study Context

Community Paramedicine (CP) has been promoted as a strategy to help rural communities, which frequently experience significant health care disparities and service gaps.

CP addresses the Institute for Healthcare Improvement's Triple Aim:

- Improve patient experiences of care
- Improve population health
- Reduce health care costs

…and a fourth aim (the "Quadruple Aim"*):

- Improving the work life of health care providers

*Bodenheimer, T., & Sinsky, C. (2014). From Triple to Quadruple Aim: care of the patient requires care of the provider.*The Annals of Family Medicine*,*12*(6), 573-576.

Study Aims

Improve our understanding of CP programs that serve rural communities:

1. Organizational characteristics
2. Goals, target populations, and services offered
3. Integration into community systems of health care and human services
4. Evidence to demonstrate success

Methods

1. We compiled a list in December 2014 of 86 CP programs using articles, reports, presentations, and Web searches.

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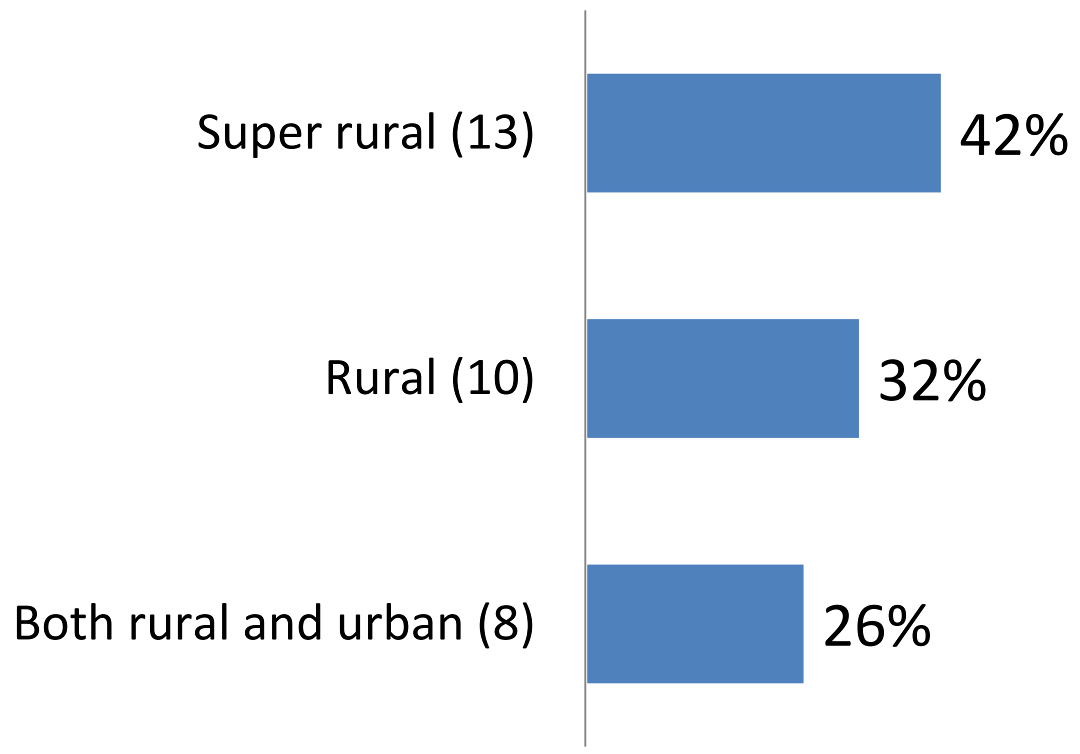
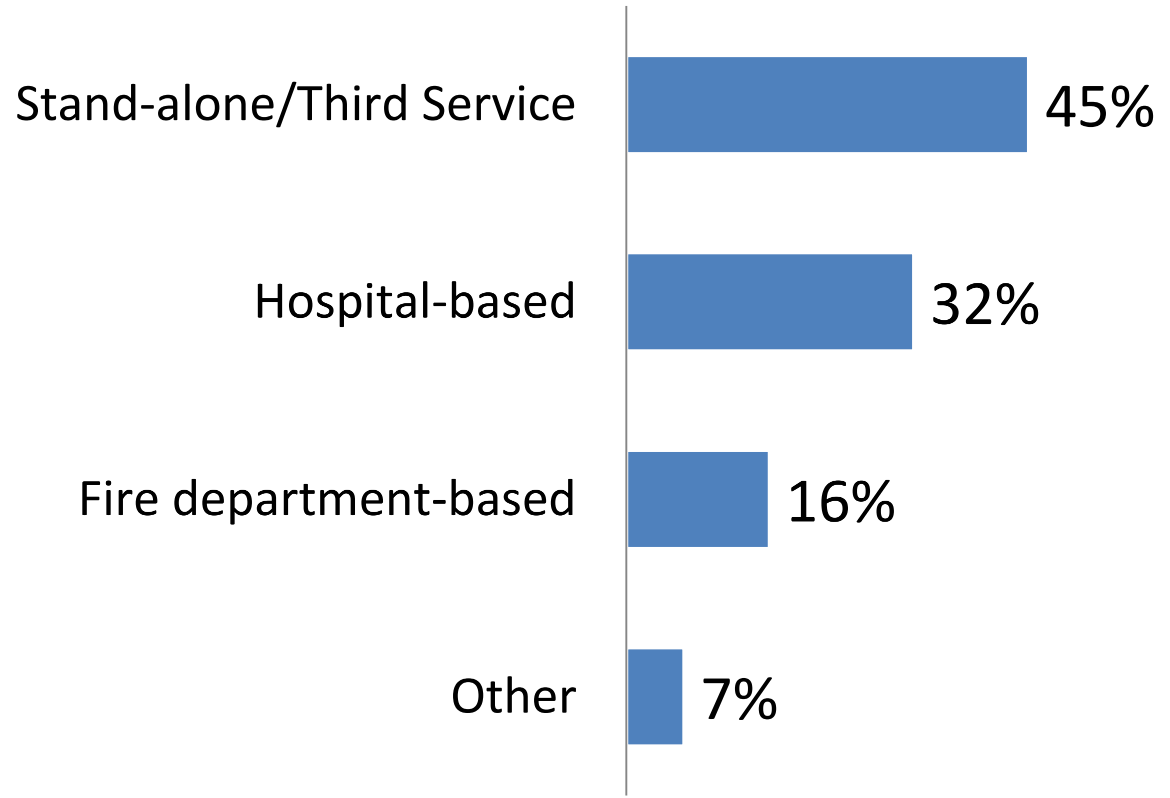
1. We compiled a list in December 2014 of 86 CP programs using articles, reports, presentations, and Web searches.
2. We identified program and service area ZIP codes, classifying them using Rural-Urban Commuting Area (RUCA) codes.
3. We conducted structured interviews (about 30 minutes) with 36 program leaders (100% response):
   - 31 programs serving rural communities
   - 5 urban programs that had generated evidence on outcomes

Final sample



EMS organization type



Program characteristics

Service area population:

- 35,000 (median), from 1,950 to 2.3 million

Time CP program in operation:

- 29 months (median), from 2 months to 13 years

Staffing:

- 7 community paramedics each providing 0.4 FTEs (median), from 1-60 persons and 0.1-10.0 FTEs

Funding*: More than 3/4 were self-funded only or relied on a single external funding source.

Funding source	Percent
Self-funded	58%
Health care provider	32%
Federal government	13%
State government	13%
Local government	13%
Foundation/charitable trust	10%
Insurer/health plan	7%

*Programs could report multiple funding sources

Program goals and the Triple Aim

	Improve patient experience	Improve population health	Reduce costs
Improve patient satisfaction with care	✱		
Improve management of chronic disease		✱	✱
Prevent falls in the elderly		✱	✱
Increase/decrease outpatient visits*		✱	✱
Increase immunizations		✱	✱
Prevent traumatic injury		✱	✱
Reduce hospital admissions or readmissions			✱
Reduce ED visits			✱
Reduce EMS/health care costs			✱
Reduce EMS use/transports			✱
Refer or transport to alternative destinations			✱
Reduce inpatient length of stay			✱

*Programs aim to connect patients to appropriate care, which can mean increasing or decreasing outpatient visits.

Program goals

Goal	Percent
Improve management of chronic disease	90%
Reduce hospital admissions or readmissions	84%
Reduce emergency department visits	84%
Reduce EMS/health care costs	84%
Improve patient satisfaction with care	81%
Reduce EMS use/transports	71%
Prevent falls in the elderly	71%
Increase/decrease outpatient visits	48%
Increase immunizations	36%
Refer or transport to alternative destinations	19%
Reduce inpatient length of stay	16%
Prevent traumatic injury	13%
Other	23%

Target populations

Target population	Percent
Chronically ill	90%
Post-discharge	81%
Frequent EMS users	65%
Elderly	48%
Mental health	23%
Alternate destination, minor illness	19%
Uninsured	16%
Hospice	16%
Substance/alcohol abuse	16%
Children	10%
New parents	6%
Other	45%

Patient referral sources and destinations

	Only receives patient referrals from…	Both receives patient referrals from and refers patients to…	Only refers patients to…
Primary care facilities	0%	70%	23%
Hospitals	19%	55%	10%
Other physician groups	29%	19%	13%
Social service agencies	7%	19%	29%
Home health	3%	39%	10%
Hospice	10%	13%	16%
911 dispatch	16%	7%	13%
General public / self referrals	32%	0%	0%
Law enforcement agencies	16%	10%	7%
Mental health care facilities	7%	7%	19%
Skilled nursing facilities	7%	10%	13%
Addiction treatment centers	3%	0%	16%
Urgent care	10%	0%	10%
Other EMS agencies	10%	3%	3%
Other	19%	7%	7%

Program services

	Percent
Assessment services	
Check vital signs	100%
Check on patient/physical assessment	97%
Conduct home safety/fall risk assessment	94%
Administer EKG	94%
Monitor weight/dietary needs	87%
Laboratory services	
Test blood glucose	94%
Draw blood	65%
Other laboratory services	29%

Program services (continued)

Preventive care services

Service	Percent
Preventive care for chronic conditions	90%
Administer vaccines	45%
Other preventive care services	23%

Acute care services

Service	Percent
Basic wound care	68%
Minor medical procedures/treatments	26%

Program services (continued)

Other services

Service	Percent
Medication inventory/compliance	90%
Discharge instruction explanation/compliance	87%
Coordinate patient care	77%
Link to healthcare/other community resources	74%
Respiratory services	65%
Behavioral health services	26%

Of programs aiming for each goal, how many are measuring?

Goal	Currently measures	No plans to measure
Improve patient satisfaction with care	92%	0%
Reduce hospital admissions or readmissions	85%	4%
Reduce emergency department visits	85%	8%
Refer or transport to alternative destinations	83%	17%
Reduce inpatient length of stay	80%	20%
Reduce EMS use/transports	77%	18%
Reduce EMS/health care costs	77%	15%
Increase/decrease outpatient visits*	67%	33%
Improve management of chronic disease	64%	32%
Prevent traumatic injury	50%	50%
Prevent falls in the elderly	46%	55%
Increase immunizations	46%	46%

*Programs aim to connect patients to appropriate care, which can mean increasing or decreasing outpatient visits.

Evaluation findings are **promising** but ***preliminary***!

20/31 programs had generated outcome data

13 (42%) programs provided the study team their evaluation outcomes.

Most evaluations were internal and informal:

- One longitudinal case-control design; otherwise no control groups or other rigorous methods

Evaluation findings

Desired outcome	Number of programs reporting	Aggregate outcomes	Selected individual program outcomes reported
Reduce hospital admissions/ readmissions	8	655 avoided (N=5)	· 76% reduction in total hospital readmissions · 44% reduction in readmissions for heart failure patients · 41% reduction in readmissions for CP patients · 0 readmissions in the first two quarters of 2015
Reduce EMS/healthcare costs	8	$7,461,981 savings (N=7)	· $8,500 savings per CP patient · $1.5 million savings through transport to alternate destinations · CP program saved 33% more than it cost to operate
Reduce EMS use/transports	6	1,428 avoided (N=5)	· 37% reduced use for top 15 frequent EMS users · 206 transports avoided

Evaluation findings

Desired outcome	Number of programs reporting	Aggregate outcomes reported	Selected individual program outcomes reported
Reduce emergency department (ED) visits	5	1,552 avoided (N=3)	· 1,121 avoided · 58.7% reduction in avoidable visits · 50% reduction in ED usage by CP patients
Improve patient satisfaction with care	3	--	· Mean satisfaction scores exceeded 4.9/5 · 99% would recommend the program to someone else
Increase or decrease outpatient visits[b]	2	178 prevented (N=2)	· 11 wound dressing changes at home may have prevented office visits
Increase immunizations	2	327 vaccinations (N=2)	--

Evaluation findings

Desired outcome	Number of programs reporting	Aggregate outcomes reported	Selected individual program outcomes reported
Improve management of chronic disease	2	--	· 85% of diabetic patients decreased blood glucose; 70% of hypertension patients decreased blood pressure; COPD patients decreased ED admissions for shortness of breath by 91.6%
Improve quality of life	2	--	· 67% of patients same/better health status as at first CP visit; 59% same/fewer physical limitations · 7% increase on standardized quality of life instrument
Prevent falls in elderly/traumatic injury	2	--	--
Refer/transport to alternative destinations	1	502 transports (N=1)	· $1.5 million savings through transport to alternate destinations
Reduce inpatient length of stay	0	--	--

Conclusions and implications for rural-serving CP programs

Can programs meet the Triple Aim?	▪ ***High patient satisfaction*** ▪ Potential to shift costs from more to less expensive settings ▪ Appropriate care where vulnerable patients live has potential to improve health.
Impact on the workforce? (Quadruple Aim)	▪ More study needed. (Note: some programs use volunteers.)
Integration or competition?	▪ Many programs were well integrated into health and human services systems.
Does CP work?	▪ We need more evidence to show that CP is safe, effective, and economical.
Is CP sustainable?	▪ CP programs (many self-funded) need evidence to demonstrate value and improve long-term sustainability.

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