INTEGRATING THE SOCIOLOGY OF STANDARDS WITH COMMUNITY PARAMEDICINE

By

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Abstract

As of 2019, over 130 community paramedicine (CP) programs exist internationally. These are the goals that community paramedicine seeks to achieve: prevent hospital readmissions, reduce frequent EMS (emergency medical service) and ED (emergency department) user's reliance on emergency services, provide alternative and more appropriate destinations for patient care, and chronic disease management by increasing patient access to primary care services. There is no way of assessing if these common goals are being met because programs today use a diversity of different strategies, techniques, and measurements when providing care. This reflects different electronic interfaces, different patient referral forms, different program evolution patterns, and different program strategies. For example, the use of an urban or rural community paramedicine model, or the use of one software in favor of another. The consequences of these different strategies include: failure to legitimize CP as an emerging type of healthcare, failure to optimally control program costs, failure to develop a language for communication that is understood by all community paramedics, failure to make data comparable between different programs, and failure to advance the outlined goals of CP. Drawing on the sociology of standards, this thesis proves that terminological and procedural standards can address these problems by creating a common language for communication and clinical practice guidelines for all community paramedics. Without the creation of such standards, the above consequences will not be remedied. Community paramedicine programs will have the ability to overcome the consequences I have listed through the creation and implementation of these standards.

Question

How can terminological and procedural standards help community paramedicine programs achieve their goals?

Vignette: A pre-medical student walks into a fire department...

It's 8:00 am and sunny outside at the Tucson Fire Department, Fire Central. Four members of the community paramedicine program, TC-3, sit around a rectangular table with tablets open in front of them and papers scattered around. Two interns from the University of Arizona Honors College, Alex and Will, sit alongside and take notes.

Captain Ellis, Sergeant Stone, and Sam[1] are discussing the clients whose homes they will visit today. At the same time, Sergeant Mills is reviewing the newly referred clients from the previous 24 hours.

Mrs. Smith[2] dialed "911" 20 times in the past month. She called over 200 times last year. All of these calls resulted in the fire department dispatching transportation resources. Over half of the calls resulted in ambulatory transport to the emergency department. The interns wondered why somebody would call 911 so much.

Alex asks Captain Ellis, "Do you think Mrs. Smith is experiencing a medical emergency when she calls 911?"

Captain responds. "It's a lot more complicated than that. I do not think Mrs. Smith's life is in immediate danger when she calls for us most of the time. But in a way, she is experiencing an emergency. A life emergency. She needs help."

Alex follows up. "Do the services you and the team provide stop her from calling 911?"

Captain sits up in his chair. "Absolutely. I've seen differences in so many community members lives as a result of this program. Having someone, anyone, to actively check up on you

[1] Pseudonyms for the interns, all personnel and all clients are used protect confidentiality.
[2] Mrs. Smith is a composite patient representing numerous interactions I had during the semester. She is not based on a specific person and illustrates only a fraction of the health complications many enrolled patients suffer from.

and make sure your health needs are met, is a big deal. Especially for the people that call the most."

Captain Ellis and Sam stand up from the table to get their walkie talkie before heading into the field with the interns for the day. Mrs. Smith has been under the team's care for a few months now and needs a new smoke detector. She suffers from emphysema and chronic bronchitis due to her chronic obstructive pulmonary disease (COPD). They walk downstairs into the garage, where Captain and Sam start the large, red, TC-3 van.

It's now 10:00 am. Alex and Will recognize the strong scent of alcohol permeating the air as they approach the front walkway of Mrs. Smith's home. A security door covers the front door and rattles loudly as a fist from the Tucson Fire Department knocks. Alex looks down at the pavement and notices a cockroach lining the wall adjacent to them.

Captain Ellis knocks again. "Mrs. Smith, It's Captain Ellis with TC-3. We're here to check in one you and change your smoke detectors." The security door opens, and from behind a barefoot, older woman is visible using the assistance of a walker. Her response is raspy and genuine. She coughs before speaking. "It's nice to see you both again, please come on in. Sorry it's a little messy."

The interns feel like they are in another world after walking inside. It is incredibly dark. The walls, furniture, and carpet, seem to be permanently infused with, what was to them at least, the noxious smell of cigarettes. Something else overwhelms their nasal cavities too: the scent of organic decay, of rancidity. The interns move through small lanes carved out of trash on either side of the carpet to get to the kitchen. They pass half eaten cans of beans, dirty clothing, and once full containers of Smirnoff. A large tower of cigarette boxes sits haphazardly beside the television. Trash piles directly next to the trash can.

The interns follow Sam into the kitchen, where the provenance of these odors became apparent. Dirty cups and cutlery cover her countertop. Streaks of black wrap around the large white door and *into* the fridge. Sam opens the fridge and a flurry of insects fly out.

Mrs. Smith sits down on her sofa in the living room, followed by the team of four. The interns look at each other, not knowing where to sit, and not feeling comfortable sitting on any of the furniture around them. Captain Ellis and Sam pull out and expand their portable stools. Alex and Will watch in awe as both sit down directly in front of the client, within inches of her face. Alex feels surprised by the respect both Sam and Captain treat the patient with. Their gentle body language and proximity invite Mrs. Smith to discuss what is going on in her life without fear of judgement. Sam has a pen clipboard in hand and looks Mrs. Smith in her eyes. “It’s good to see you again. Have the meals been coming regularly?” Sam asked.

Mrs. Smith: “They have.”

Captain Ellis: “Last time Sam and I visited, we discussed making you an appointment with a primary care doctor that we found for you. Have you made that call Mrs. Smith?”

Mrs. Smith: “No. Last week when I called you guys for my chest pains one of you threw my phone into a bush and broke it! I need to get a new one now.”

Captain Ellis: “I’m sorry to hear that.”

Sam: “Why did you call 911 that time?”

Mrs. Smith: “I couldn’t get up from my bed that morning because of my back! So, I called you guys to help me up and into the kitchen.”

Captain Ellis: “Do you think that was an appropriate reason to call 911?”

Mrs. Smith: “What was I supposed to do instead? Lay there all day?”

Sam: “How about this. Let’s make the call right now, on my phone instead, and get you scheduled for the primary care doc.”

Captain Ellis: “I agree. The sooner we can get you in, the sooner we can address your breathing problems and figure out your next best treatment plan.”

All four leave the home 40 minutes after arriving. Mrs. Smith has two new smoke detectors and an appointment with a primary care doctor at her local community health center within a bus ride of her home.

Explanation

Mrs. Smith is elderly, unemployed, of low socioeconomic status, lacks personal transportation, and is without health insurance. She does not have living family members and is socially isolated. These issues are compounded by her deteriorating health status and chronic conditions that require constant treatment to manage. She relies on 911 for all her healthcare needs, and this reliance strains the first responders that field her calls. It is not uncommon for interactions like this to occur, where both the patient and paramedic are left dissatisfied with the level of care provided and received.

Introduction

Community paramedicine programs work with community members who dial 911 most frequently. Several studies have been published to advocate for this model of health care delivery.[3] Program intervention seeks to reduce the amount of times a patient calls 911 and mitigate their reliance on the emergency services system. This leads to a more efficient use of emergency service resources, reduced costs for the department, and better patient health outcomes.

CP programs require first-responders to shift their scope of practice from exclusively emergency care services to include what are widely considered primary care services.[4] Community paramedics will do everything in their power to avoid future hospital readmission. This contradicts the traditional roles of EMS paramedics who are trained to respond to exclusively emergency calls that require transport to an ED. However, this shift has not been accompanied by a shift in procedures paramedics perform or in the terms they use to communicate. For example, frequent utilizers cost EMS systems exorbitant amounts due to unnecessary ambulatory transport, but an agreed-on definition of what constitutes a 'frequent utilizer' has yet to be established.

I began by framing the issue that community paramedicine programs were designed to address through a vignette that illustrates what an encounter with a "frequent utilizer" looks like.

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[3] Do et al. study the effect a paramedicine program has on program participants and paramedics by identifying common themes throughout interviews. They find a community paramedicine program to be positively correlated with emotional support, diseases management, and safety for participants involved. They find the program to be associated with increased job satisfaction for paramedics.

[4] The terms primary care and medical care were at one time synonymous. The expansion of medical military personnel in the US during WWII played a crucial role in the separation of the two. Many physicians went to war general practitioners but returned home wanting to receive specialty training. They were incentivized to do so through the GI Bill of Rights and development of the Veterans Administration. The number of available residency slots increased five times from 1942 to 1952. President Nixon openly acknowledged the shortage of primary care physicians as part of his national health policy in 1971 (Howell 2010).

I will now discuss the relevant literature on this topic. There are two bodies of literature I rely on. The first is from emergency medicine journals, specifically those discussing CP programs. The second body of literature comes from journals of sociology, specifically those discussing standards and standardization. I arrived at the conclusion that the sociology of standards has key insights in helping CP programs reach their goals and addressing the problems faced by CP programs today. Standards exist so that organizations can objectively and impartially evaluate if their goals are being met and to what degree. They form impersonal and unbiased benchmarks against which to measure the quality services provided. This type of objective and unbiased benchmark does not exist within community paramedicine. This paper meaningfully connects these two bodies of literature for the first time and provides key insights for future CP program directors seeking to implement their own standards.

Literature Review: **Community Paramedicine**

I will now frame the issues that community paramedicine programs are designed to address through a quantitative study on ambulance misuse and on the patient characteristics of frequent utilizers of emergency services systems.

Framing

Current literature indicates that misuse or unnecessary use of ambulance transport to emergency departments (EDs) is an international phenomenon. Several studies have been published on frequent users of the emergency department, ambulatory transport, and emergency service systems.[5] Palazzo et al assess the degree of inappropriate use of the London Ambulance Service and the reasons for misuse in their study. They estimate that up to 52% of the 500,00 annual calls the ambulance service receives are not medically warranted. Three hundred consecutive ED arrivals were assessed by three parties: the ambulance driver, the attending physician receiving the patient, and an independent ED consultant. Patients were invited to state their reason for calling the ambulance if present during the evaluation. Unanimous decisions were deemed either inappropriate or appropriate, and split-decisions were recorded. Of the 300 ambulance arrivals studied, 47 (15.7%) were inappropriate, 161 (54%) were appropriate, and in 57 (19%) cases unanimity was not achieved. Inappropriate callers report they were either unaware that an emergency general practitioner was available or that they had no other means of reaching the ED. Just 15.7% of inappropriate ambulance calls represents 75,000 annual ambulance transports not required. The authors discuss that the assessment is subjective because no recognized criteria for assessing the appropriateness of an emergency ambulance call exists.

[5] Refer to Billitier et al, Brown et al, Diamant et al, Palazzo et al, Wilkin et al.

Nolan et al highlight three prevailing characteristics of the patient population that call 911 most often. First, this group is vulnerable due to chronic health diseases, poor living conditions, and old age. In Canada, seniors represent 14% of the population but account for 40% of used hospital services. Approximately 60% of paramedic responses are for patients over the age of 60. Second, they are marginalized for their low socioeconomic status. Many are on fixed incomes and do not have the financial means of accessing basic healthcare. Third, frequent utilizers are more likely to be socially and culturally isolated from a support network. They often live alone or estranged from their friends and families.

History

I will now discuss what community paramedicine is, provide a brief history, stipulate their goals, mention current successful programs, and outline some of the challenges these programs face.

According to the National Association of Emergency Medical Technicians (NAEMT), community paramedicine uses emergency medical services personnel to meet community health needs and fill local gaps in healthcare infrastructure. Community paramedicine programs are innovative systems where paramedics engage in non-traditional roles to assist in improving population health (EMSCC). This model of care delivery originated in rural parts of North America.

In their second national survey[6], the NAEMT indicate that community paramedicine started in Canada in rural areas such as Nova Scotia, where patients suffering from chronic conditions had minimal access to primary care and little means of reaching the doctor's office. The first operational community paramedicine program in North America was founded in Nova Scotia. The first community paramedicine programs in the United States were soon after founded in rural areas, including Maine and Minnesota.

Rural United States EMS agencies were having a hard time being reimbursed for the services they were providing to their communities. This is because ambulances are traditionally considered taxi services. Indeed, commercial insurers and centers for Medicare and Medicaid (CMS) both categorize EMS as a fee for service transportation provider. This means EMS

[6] As of May 2019, there have been two national surveys administered to community paramedicine programs by the NAEMT (2014 and 2017). These surveys asked comprehensive questions about training, staffing, payment, public support, and measuring success. The data was analyzed by a collection of prominent community paramedics from multiple states. The subsequent reports were written in accordance with the surveys. Both reports span thirty pages and provide further detail about community paramedicine programs and their goals. See Zavadsky et al.

agencies in the United States do not receive financial reimbursement unless they physically transport a patient to the ED, and thus are incentivized to do so.

EMS personnel are uniquely positioned to help programs reach their goals as trusted health care professionals available 24/7 and used to working in the field. It is estimated that local fire departments provide half of all emergency medical services in the United States and almost all of these calls result in ambulatory transportation to an ED (Iezzoni et al). First responders are also most familiar with the individuals who call 911 most frequently. The practitioners of community paramedicine therefore include emergency medical technicians (EMTs), advanced emergency medical technicians (AEMTs), paramedics (EMT-P), firefighters, and first responders, all of which are considered EMS personnel.

Goals

I will now discuss the goals of community paramedicine programs, and where these goals are derived from. Though the specific goals of each program are identified through a community needs assessment, each goal follows an outline provided by the NAEMT and IHI.

Community paramedicine program goals are designed in accordance with the Institute for Healthcare Improvement's (IHI) Triple Aim: improved patient experience of care, improved population health and reduced per capita cost of healthcare[7].

The NAEMT identifies four goals that all community paramedicine programs are designed to meet. First, preventing hospital readmissions. Research indicates that hospitals can lower readmission rates through a multifaceted approach involving patient education, post discharge follow-ups, and coordination between primary care physicians and other community-based healthcare providers. Second, reducing frequent EMS and ED user's reliance on the emergency services system. By navigating patients to alternative, more appropriate, and more cost-effective health resources, community paramedicine programs seek to mitigate the amount of times an individual call 911 for non-emergency conditions. Third, chronic disease management. EMS practitioners frequently enter the homes of their patients, so are positioned to help recently discharged patients fully understand his or her discharge instructions and educate patients on self-management techniques for various conditions. Fourth, and as seen above, providing alternative destinations. Studies show that many patients treated in the ED could be

[7] The triple aim is care, health, and cost. It is a framework developed by the IHI in response to the growing demands of healthcare systems. For example, aging populations coupled with chronic health problems have become a global challenge. Therefore, it is a well-accepted approach for optimizing health system performance. This is important because the US healthcare system accounts for 17% of its Gross Domestic Product, and that number is expected to rise to 20% by 2020. The IHI claims improving the US healthcare system requires the concurrent pursuit of all three of these aims. However, meeting them requires the existence an organization that accepts the responsibility for all three aims for a given population. For the purposes of this paper, that organization is the local fire department and EMS agency. Patients can expect less complex and more coordinated care as a result of the triple aim. See "The IHI Triple Aim".

safely and less expensively treated in other locations. These include primary care offices, mental health facilities, rehabilitation facilities, and even the patient's home. It is important to note that these goals are not entirely one size fits all. They depend on the unique needs of the community in which the program is operating as identified through a comprehensive needs' assessment, but are still at the core of community paramedicine services.

Cultivating relationships with local community resources is essential to achieving these goals. Community paramedicine programs must actively seek and maintain collaborative relationships with local social and healthcare organizations. This is how programs navigate their patients to the appropriate alternative destinations. These include hospitals, clinics, social service agencies, mental healthcare facilities, hospice, public health agencies, addiction treatment centers, nursing homes, third party payers such as insurance companies, care management agencies, and law enforcement. Community paramedicine follows a referral model, meaning any of these partnered agencies can also refer their patients to the program.

Successes

Here are some examples of successful community paramedicine programs. San Diego created the Resource Access Program (RAP) in 2008 to address the needs of individuals calling 911 repeatedly. Over a 31-month period they evaluated 51 frequent utilizers and reported that EMS counters decreased by 38%, EMS charges by 32%, ED encounters at participating hospitals decreased by 28%, and charges declined by over $300,000 across all services. MedStar is a Texas based community paramedicine program that began serving its community after analysis showed that 21 patients were transported over 800 times in a 12-month period, incurring $1 million in ambulance and ED expenses. Over the next 12-months of enrollment, hospital admissions were decreased by 47% and use of ambulance transports to the ED were decreased by 56% (Kizer et al). In Nova Scotia, this unique care model resulted in decreased costs, increased access to health services, and increased collaboration between health and social care providers. Mainland visits decreased by 28% and ambulatory transports to a hospital ED decreased by 40% over a five-year period. Likewise, Toronto's Community Referrals by EMS (CREMS) successfully reduced paramedic responses to the most frequent 911 callers by 73% in 2010 (Nolan et al).

Challenges

I will now examine the three primary challenges Iezzoni et al identify facing community paramedicine programs today. First are workforce challenges. How much extra training (if any) should a paramedic receive before becoming a community paramedic? This is an ongoing debate. According to the NAEMT, 27% of programs require college-based community paramedic education, a 2-year certificate program, and require behavioral health crisis intervention training, better preparing practitioners to deal with patients in mental health crisis and experiencing substance abuse. This is not true for all programs, however, and determining what degree of qualification the paramedic needs is the responsibility of the individual EMS agency. Therefore, there is high variation in the amount of training different community paramedics receive.

The second challenge facing programs today is funding and reimbursement. Several literatures identify the ambulatory transport model as a barrier to long term program success. Kizer et al discuss this issue from the perspective of California based programs in their report from UC Davis. Funding for local EMS agencies is derived from revenue streams generated by traditional patient transport, so community paramedicine funding depends on the number of transports. This contradicts the purpose of the program. Huff et al also indicate that the ambulatory reimbursement payment model is highly problematic for community paramedicine program advancement, where Medicare and Medicaid will not pay for ambulance services that don't involve patient transport. This is important because most community paramedicine programs operate with a tight budget. Their sources of revenue include fee for service (31%), fee per patient (13%), fee for enrollment (6%), shared savings with partner organization (6%), population-based payment (9%), and other (19%). The challenge becomes generating sufficient

revenue to support staffing, operational costs, and data collection, all without being reimbursed as a care provider. While some agencies are highly successful in generating revenue for their programs, a majority are bringing in no revenue or very little.

The third challenge is deciding how community paramedicine programs should collect, integrate and coordinate information with partnered services and agencies. The Minnesota Department of Health (MDH) note one challenge with collecting and reporting data on programs is the variety of electronic health record (EHR) systems available. This problem arises "because EMS and other EHR systems are not yet compatible, so Minnesota community paramedicine agencies are using different methods, systems, and programs for charting medical records and for data collection and analysis" (MDH Community Paramedicine Toolkit). Using multiple patient care record systems makes barrier to entry difficult for small and rural EMS agencies that rely on subjective paper notes instead of electronic PCRs.

While EMS is essential to the health care delivery system, it is not well integrated into other third service care providers, including the agencies community paramedicine programs partner with. The inability of EPCR data systems to fully integrate with hospital data systems is problematic. The NAEMT reports that 25% of programs use commercially available community paramedicine specific systems, 21% use word processing and spreadsheet software, and 13% collect information with pen and paper. Therefore, there is need for a more uniform approach for the electronic exchange of information.

Solutions

I will examine most closely the third challenge, data exchange and collection. If data collection methods (including reporting forms, patient intake forms, and patient referrals) were made uniform, it would mitigate discrepancies between agencies. Each paramedic would be collecting the same data, using the same techniques, to produce consistent and reliable results. This is not the case. Data collection and reporting are important to both the program and its partnered healthcare agencies for two reasons. First, data proves that the program is working and impacting its community in the desired way. It provides an objective interpretation of how successful the program is at meeting its goals. Second, if the desired community outcome is not being reached or the goal not being achieved, data is the foundation for developing and testing alternative strategies.

Programs located across the country from one another should be confident they are reporting with the same level of objectivity. It should not matter where or when the community paramedic sees the patient. This uniformity would help overcome the challenge of data collection and integration by providing a data collection form, or specific collection protocols, that are understood by all community paramedics. Overcoming the data collection and integration challenge advances all four goals of community paramedicine simultaneously.

Literature Review: The Sociology of Standards

I will now be drawing on the sociology of standards in order to show that standards and the process standardization can be used to create uniformity and objectivity within community paramedicine in order to help programs achieve their goals. This is because standards increase task complexity, increase efficiency, and provide objective benchmarks against which to measure criteria.

Sociologist Benjamin Singer was the first to propose for the development of a social science of standards. This is a model for understanding the social dynamics of standards in institutions such as medicine, law, education, and science. Industries were arguing over systems standards assessments, because no attempt to understand standards across different institutions had been made. Singer identifies a lack of unified effort to unite different institutions using standards as the basis for doing so. Thus, a new lense through which to view the processes of standards was created: the social lense.[8] "A sociology of standards would make possible comparisons cross institutions and professions, and facilitate the analysis of gaps between the core values of institutions and the operational standards or criteria actually in place" (Singer 205). Comparisons across institutions would be incredibly helpful for community paramedicine programs and their community partnerships, because they would be able to more easily identify what practices work best and those that do not.

[8] Singer published another article later that year in defense of his first. This was in response to sociologists who disagreed with his claims and were openly criticizing the sociologist. He defends the need for clarification of the frequently used concept (standards) and claims his paper was an attempt to stimulate activity in a neglected area of sociology. Singer believes such criticism is the result of the exact phenomena he is describing - the unwillingness for sociologists to confront the idea of standards in their discipline. See "In Defense of Standards as a Sociological Concern".

Kinds of Standards

There is not a single type of standard. Instead, there are different forms of standards, each of which are useful in different situations and contexts. I will now discuss the types of standards and their uses.

In their seminal 2003 book, *The Gold Standard*, Timmermans and Berg outline the challenges of evidence-based medicine (EBM)[9] and standardization and discuss how the world of medicine is actively shaped through standardization. Standards and standardization are placed in the foreground as ubiquitous phenomena that regulate social life by rendering different parts of the world equivalent across time, space, and culture.

They focus on what standards actually do in medical practice based on three tenets with methodological implications. *Situated knowledges* follows standardization from the perspective of particular actors and recognizes that different agents recognize the same events differently. *Blurred agency* follows actor-network theory and views standards as exerting agency in particular situations with other agents. *Emergent politics* states that standards are inherently political because they change the positions of different actors and reorder social practices. Standards do not achieve this in isolation, instead in large networks of humans and machines where their full properties emerge.

Timmermans and Berg define *standardization* as the process of rendering things uniform, and *standard* as the means and outcome of standardization. They identify four kinds of standards. First, *design standards* set structural specifications. For example, the properties of an x-ray machine, size of hospital beds, and sizes of injection needles. They are explicit

[9] EBM is a subset of the current standardization movement within Western medicine. It calls for the use of clinical practice guidelines that are based on scientific evidence in order to make the most informed patient care decisions possible. Proponents of this model remain agnostic as to why something should or shouldn't work and instead focus on objectively measuring whether it works in real-life scenarios (Timmermans and Berg 2005).

specifications that ensure uniformity and mutual compatibility throughout social or technical systems. Second, *terminological standards* ensure stability of meaning over place and time and facilitate the aggregation of individual health care data into larger wholes. The statistical overviews of library databases and causes of death would not be possible without their presence. Third, *performance standards* set outcome specifications. For example, minimum test scores for acceptance into a program or maximum complication rates for an operation. They are most helpful when regulating professional work, because they do not prescribe what has to be done or how it should be done, only what the result should be. Fourth, *procedural standards* specify processes. They are essentially clinical practice guidelines that delineate what specific steps should be taken if a specific condition is met. *Procedural standards* raise the stakes of standardization to the highest level and form the core of evidence-based medicine. Procedural standards attempt to prescribe the behavior of professionals, which is a very difficult task. They do so by bringing together people from different disciplines with a variety of diagnostic techniques.[10]

[10] Two additional types of standards are of importance in the medical context. The *standard of care* is a legal concept that refers to the level of medical care than be reasonably be expected from a practitioner in a given situation. These standards evolve based on what is acceptable in a medical subspecialty. The *gold standard* is the ultimate standard. It provides a measure against which all other standards can be measured. These types of standards possess such authority that their evolution resists time. The current *gold standards* in health care are evidence-based medicine and randomized control trials.

Terminological and Procedural Standards

I will now discuss the two types of standards most beneficial for community paramedicine programs to implement. These are terminological and procedural standards.

I rely on Timmermans and Bergs definition, calling standardization a process of rendering things uniform, and the standard as both the means and outcome of standardization. Standards are ubiquitous social phenomena that regulate our lives constantly. They can be thought of as rules or guidelines to follow and imply a script to follow for all adopters. Due to the importance of both procedural standards (best practices for physicians, clinical practice guidelines, research protocols) and terminological standards (ensuring the definition of a given medical term or diagnosis remains the same over time and space) in today's world of evidence-based medicine, I examine how these two types can help community paramedicine programs achieve their goals.

Procedural and terminological standards are powerful coordinating devices. By utilizing procedural standards, health care workers integrate this type of organization into their activities without having to do the organizing themselves. In turn, procedural standards afford an increase in the complexity of healthcare providers' work. By utilizing terminological standards, health care workers can be confident they are talking about the same medical condition despite being separated by time and space. In turn, they too afford increase in the complexity of healthcare provider's work, now able to document complex diseases and illnesses with a few key words or terms.

Both bring together different professionals around the same case, as the terminology and standard language can be understood by multiple care providers. The procedural standard coordinates the activities of many providers along the patient's continuum of care. "The standard

brings together different professionals around one case: it articulates the activities of nurses, oncologists, pharmacists, and cardiologists. As in the case of the individual insurance physician, the complexity of this collective arrangement is made doable by the standard. It outlines the distribution and content of tasks, and ensures that the individual activities of all those involved become an integral part of the larger care process" (Timmermans and Berg 67).

The outcomes of standardization are of most benefit to grassroots organizations seeking to empower the individual in controlling their day to day lives. Standardization itself has no political valences and promotes a diversity of interests from different stakeholders. This is very much like community paramedicine programs, which seek to empower the patient to advocate for their own health needs rather than rely on the 911 system and paramedics to do so for them. Programs advance the interests of both their patients and their partnered health and social service agencies.

Standardization is an active, dynamic, and social process that strives towards stability and order, and "it consists of building a society around a standard with an implied script that bring people and things together in a world already full of competing conventions and standards" (Timmermans and Epstein 84). The impact of this process can be seen most clearly in concrete, social settings (such as the fire department or EMS agency), where the ability of a standard to regulate social behavior is greatest. This process already exists in firehouse culture through the ranking hierarchy system that exists paired with intense social pressures both men and women face. Put simply, everybody in the firehouse knows their specific role and script to follow. They follow these scripts in order to maintain social stability and order during their work days. Paramedics already have their social behavior regulated by their superiors, so resistance to the

standard and processes of standardization should be minimal compared to members of an organization that do not have as rigid a form of social regulation in place.

Phases

An individual or organization cannot simply implement a standard without being aware of the discrete life phases a standard goes through before being used as intended. The standard will not immediately be effective and may face resistance. Timmermans and Epstein divide the life course of a standard into three discrete phases: creation, implementation and resistance, and outcomes. I will now discuss each of these life-phases in detail.

Standards each have their own creation history. Early standards emerged as plausible solutions to unique historical contingencies, meaning their aims and goals are embedded in that context. For example, the intention behind standardizing the modern railroad track gauge size, and the stakeholders involved, greatly differ from the intentions and individuals behind standardizing rapeseed growth in China for agricultural purposes. A government might require the adoption of a standard for regulatory purposes, whereas an environmental organization may need compliance with certain standards to obtain certification.

A recurrent theme is that the creation of a standard is a fundamentally social act. In order for a standard to work in a truly standardized way, it requires the collaboration of multiple others. “The creation of standards can thus be thought of as the meeting of numerous parties with the aim of obtaining legitimate coordination, comparability, and compatibility across contexts” (Epstein and Timmermans 75). Standard setting is accomplished my multiple parties that may be directly or indirectly affected by the standard. Therefore, standards have the potential to be powerful regulatory tools, but only if they are actually implemented.

Implementation is complicated. Every standard implies a script to follow that specifies the roles, skills, motivations, and final outcomes of its users. Therefore, it is incredibly important that each standard is plugged into the appropriate cultural or physical infrastructure, or it might

not function properly. Each standard achieves some small or large degree of changing social order. This means the standard must be flexible and applicable in a variety of settings. The ultimate outcomes that the standard achieves depends heavily on the specific circumstances under which the standard is made to work. A medical protocol standard cannot be appropriately plugged in to a non-medical setting, and so forth.

Resistance may occur when a standard is too rigidly defined. Within the medical field, loose standards with greater adaptability work better than rigid standards without adaptability. This is because many standards are tinkered with and manipulated by clinicians in actual practice. Clinicians caring for diabetes patients were found to slightly alter guidelines for treatment based on the physical capacities of their patients, and oncologists have noted switching between multiple standardized research protocols (such as the FRAM-6) depending on the perceived needs of their patients. This tinkering or alteration of the standard does not entirely undermine the standard as one might think. Instead, flexibility strengthens a standard by giving it purpose in multiple contexts, and allowing the clinician to use it when he or she deems most necessary. There is a balance between standard flexibility and rigidity that must be established during this phase.

The outcomes of standards vary. Some serve no purpose, while others go on to attain great results. Take the massive, 130-meter-high gothic cathedral of Chartres. Builders of the time lacked any theoretical understanding of structural mechanics. There was no master architect or original construction plans. Indeed, the 36-year long and discontinuous building process was made possible by a simple material standard: specifying a specific template used to cut stones into a specific shape. This allowed many builders with differing skill levels over several years to successfully complete the cathedral.

Discussion

Key Ideas and Insights

After reviewing the literature on the sociology of standards, I will now present key ideas and findings that relate to integrating standards into community paramedicine practices.

Standards parallel the objectives and values of a given institution (Anderson). These core objectives can be broken down into components. The three components of the 'standards complex' - each of the terms we associate with standards. These are values, standards, and criteria. Values are the foundation for all standards, and standards are used to reference quality or make comparisons. Criteria are the dynamic part of the standard, because criteria are applied but standards are held. Criteria operationalize standards, but core values are the foundation for those standards (Singer).

There are three aspects of criterion: a continuum along which variation in items can occur, a point on the scale that the standard specifies as optimal, and a range of acceptability on this continuum. Technical standards interpret the range as tolerable error variation, whereas performance and procedural standards consider the range any zone between the most and least acceptable states. Standards, values, and objectives are all concerned with quality (Anderson).

There are three tenets to follow that have methodological and theoretical implications. The most important for my discussion is the *standardization of organizations*[11]. This tenet highlights that standards are seen as rules created in the environment of the individual organization, and that organization is expected to adopt the standard, implying the correct

[11] The other two tenets are standardization by organizations and standardization as organization. Both are discussed in further detail. Authors claim that standards and the processes of standardization are intimately linked to organizations because standards are usually produced, disseminated, and enforced by organizations. See Brunsson et al 2012.

cultural context must be used. Early adopters of a standard do so because it is linked with positive network effects, while late stage adopters normally do so to comply with an institutionalized practice.

The sociological impact of standards is seen most clearly through scholarship that is empirical and located in concrete social settings. Our continual choice to rely on standards as a society signals our preference for this way of regulating and coordinating social life over other methods (Timmermans and Epstein). They claim that "for medical data to become comparable, for example, terminologies and communication routes need to be standardized, and technical standards have to be implemented so that the information systems of all these different parties can communicate smoothly" (Timmermans and Berg 7).

This is important for community paramedicine programs that struggle to reliably, accurately, and objectively compare their medical data with other programs and with their partnered health agencies. For example, this type of medical comparability is facilitated by terminological standards in the form of uniform and standardized patient intake forms, patient referral forms, and patient checkup forms. It is facilitated by procedural standards in the form of uniform clinical practice guidelines for community paramedics to follow in specific contexts. If the same data was being measured for each patient using the same clinical guidelines across all community paramedicine programs, this data would be much more easily compared and analyzed by practitioners.

Evidence of Standards Being Implemented

Literature indicates there are many examples of standards being used in medical care to increase quality of care, increase efficiency, and decrease liability and risk to the organization. I will now highlight some of these.

Terminology is standard inside hospitals. Faculty read, synthesize, and reiterate patient charts without ambiguity. These standard terms lead to enacting standard procedures enacted, and together these lead to predictable and reliable health outcomes across the country. This is not accidental and reflects a concerted effort by many agencies. Indeed, in 1910 the American Medical Association (AMA) set minimum standards for medical schools and American College of Surgeons (ACS) set minimum standards for operations. Both agencies arguing for a centralized approach to the delivery of medicine and care in hospitals (Timmermans and Berg 2003).

Communication suffers when the terms “norms” and “standards” are used interchangeably. This was the case between proponents of criterion-based-testing (CRT) and proponents of traditional standardized testing. CRT advocates attacked standardized tests as “norm-referenced atrocities that merely ranked students”, while standardized test advocates argued that change itself is the only safe criterion for education (Fincher 1984). In 1983, the College Board identified basic academic competencies that high school graduates needed: reading, writing, speaking, reasoning, and mathematics. These competencies provided the basis for standards through which educational achievement can be measured and assessed (Fincher).

Case Study of Standards Being Implemented in Oncology Research Protocol

I will now discuss a specific example of standards being used to ensure the success of a research treatment protocol. In chapter 2 of their book, Standards at Work, Timmermans and Berg explore what it is that standards and guidelines do in health care work using the FRAM-6 protocol and associated insurance reports as a case study. FRAM-6 is an oncological research protocol for treating patients with Hodgkin's disease who did not respond to traditional chemotherapy treatment. It was deemed a last hope type treatment. The protocol involved the collaboration of Dutch and American medical centers and had strict eligibility criteria.

Insurance physicians are of great importance to this protocol. They are responsible for the evaluation of claims of labor disability, meaning they determined whether a patient was entitled to a benefit or not. Their evaluations have both legal and medical dimensions by fulfilling minimum quality of care standards and being legally sound. Thus, insurance physicians are judged by medical and legal criteria at the same time. One powerful tool used to help insurance physicians comply with the complicated demands of individual cases is the standardized reporting form.

Standard insurance reporting forms are necessary for this protocol to work. If a claim evaluation is contested by a patient, the report itself counts as the legal document to decide what has or has not been done. Reporting forms are therefore usually made by the national organizations that employ the insurance physicians. In many cases, these are preset forms that only require the physician fill in missing pieces of text, and come in software packages.

The oncology research protocol and insurance reporting forms are two different devices. One renders the testing of a particular drug regime uniform throughout participating sites, while the other focuses on the reporting of professional work. What is important is that both forms

standardize a set of practices, actors, and circumstances. It should not matter what socioeconomic status the patient is of, or whether the exam occurs in Europe or America. What matters is the insurance physician fills out each form identically, using the same phrases in the same order.

In the above examples, we find the standardized reporting form and protocol being used to coordinating the activities of the individuals who work with them, thereby transforming the structure and sequence of these activities. Indeed, standards are tools used as coordinating devices. By utilizing procedural standards, health care workers integrate this type of organization into their activities without having to do the organizing themselves. In turn, procedural standards afford an increase in the complexity of healthcare providers' work. The use of the insurance protocols also creates scientifically structured reports that follow the pattern of hypothetical-deductive scientific evaluation of a claim (problem to investigation to discussion to plan). No matter how convoluted or messy the individual lines of reasoning are, all information ends up in the proper place.

Procedural standards' ability to transform work practices derives from the ongoing delegation of coordinative tasks. The oncology protocol is used as a tool to accomplish exactly what community paramedics are trying to accomplish in their everyday work: coordinate the activities of their partnered health and social agencies to provide appropriate care for their patients. It transformed the work practices of health care professionals by increasing the complexity of tasks they were delegated while simultaneously rendering these tasks and their outcomes uniform.

Obstacles to Implementation of Standards in Community Paramedicine

Resistance to a standard is common when it is not endowed with much legitimacy, as technically no standards possess legal authority. Therefore, it is important for organizations developing standards to include many stakeholders from different vocations and encourage consensus among them (Brunson et al). This is a possible obstacle fire departments might face when implementing standards. Firefighters are said to hate two things: the way thing are and change. However, the already rigid social structure in place at most fire departments and EMS agencies facilitates an excellent environment for the implementation of a standard. EMS personnel are familiar with the roles they must take on after adopting certain standards, as they have already done so in their emergency medical careers.

To ensure the stability of the standard over time, auxiliary support and staff are often required. Auxiliary systems provide internal or external incentives and certifications to promote standard implementation (Epstein et al). This is another obstacle standards adopters might face. Without an auxiliary team, the standard might be tinkered with and manipulated too heavily. This would undermine the purpose of the standard. Therefore, it is important that whatever terminological and procedural standards are created, that they are backed by an external agency that can incentive the adoption of those standards. For example, backing from the International Board for Community Paramedicine (IBCP) or the NAEMT would serve as powerful incentives for workers within those fields to adopt such standards.

Conclusion

This project contributes to what is already known about community paramedicine programs by evaluating them through the lense of the sociology of standards. It should be used as a tool for programs seeking to increase their efficiency and ability to meaningfully connect disparate elements (various partnered health agencies) of the patient care continuum in order to improve patient quality of care. The above literature review is as a reference for community paramedicine program administrators seeking to increase quality of care, increase efficiency of resources, and decrease liability and risk to the organization by creating and implementing procedural and terminological standards within their field.

Community paramedicine will continue to gain popularity across the world as EMS agencies realize the benefits this model of healthcare delivery offers. As the number of programs increases, there will be a need for a uniform and easily understood way for these professionals to speak with one another. This reflects the form of terminological standards. There will also be a need for best practices while in the field that are uniform to ensure that community paramedicine programs can provide a certain standard of care. This reflects the form of procedural standards.

No standard of care exists or has been created specifically for community paramedicine, however the implementation of certain terminological and procedural standards offers a promising starting point for doing so.

Further Research

As this paper has revealed, there are many obstacles community paramedicine programs must overcome to reach their stated goals. These obstacles include, but are not limited to an absence of standardization in community paramedic terminology and procedures. Future studies should aim to garner key ideas and insights from the sociology of standards. These insights can then be applied to help community paramedicine to overcome these obstacles. There are several important questions which future researchers will want to tackle. These include:

1. What is other supporting evidence from the sociology of standards and the literature on community paramedicine that shows that these standards will help community paramedicine programs achieve their goals?
2. How can these (and other) types of standards be implemented in the everyday practices of community paramedics?
3. What are the possible consequences of failing to standardize community paramedicine?

The role of community paramedicine is likely to expand in the coming decades. By 2030, an estimated 18% of the United States population will be over the age of 65, and percentage is expected to rise. Misuse of emergency services tax the paramedics involved and waste valuable resources for the emergency practitioners. This aging population will put great stress on local EMS systems, as these individuals are more are likely to suffer from chronic medical conditions and be socially isolated. Once sociological standards are properly applied to community paramedicine, a meaningful and uniform language and data set will assist in the evolution and maturation of this nascent field of healthcare delivery.

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