

Introduction

Approximately 15 years ago cellphones replaced portable VHF radios as the mode of communication between paramedics on scene during ambulance calls and base hospital physicians.

Cellphones, like VHF radio, do not allow voice transmission and reception to occur simultaneously.

Radio use requires a learned technique to signal the end of each speaker's turn talking.

Existing literature on pre-hospital telecommunication is sparse but extensive literature in other industries, such as aviation, indicate that radio communication problems are frequent and produce critical failures.

Clear paramedic-physician communication is essential during on-line medical control of paramedic practice (radio patching)

Objective

To determine the frequency and types of problems attributable to cellphone technology that arose during paramedic-physician telecommunications (radio patches)

Participants

Paramedics from 4 county Paramedic Services (Grey, Bruce, Huron, and Perth) in south west Ontario.

Base hospital physicians (1 site) who provide all on-line medical oversight during ambulance calls for these Paramedic Services.

Methods

Retrospective analysis of MP3 audio file transcripts made from all paramedic-physician ambulance communications recorded by the Central Ambulance Communication Centre (CACC) between January 01 and December 31, 2014.

Calls were identified from CACC tapes, physician records, and codes from Ambulance Call Reports.

567 pages of anonymized transcripts were read multiple times by the two authors, coded, and data was extracted onto spreadsheets.

Analysis used mixed methods - quantitative descriptive statistics and qualitative coding to develop an emergent thematic framework.

Results

Figure 1: Problems with Patches

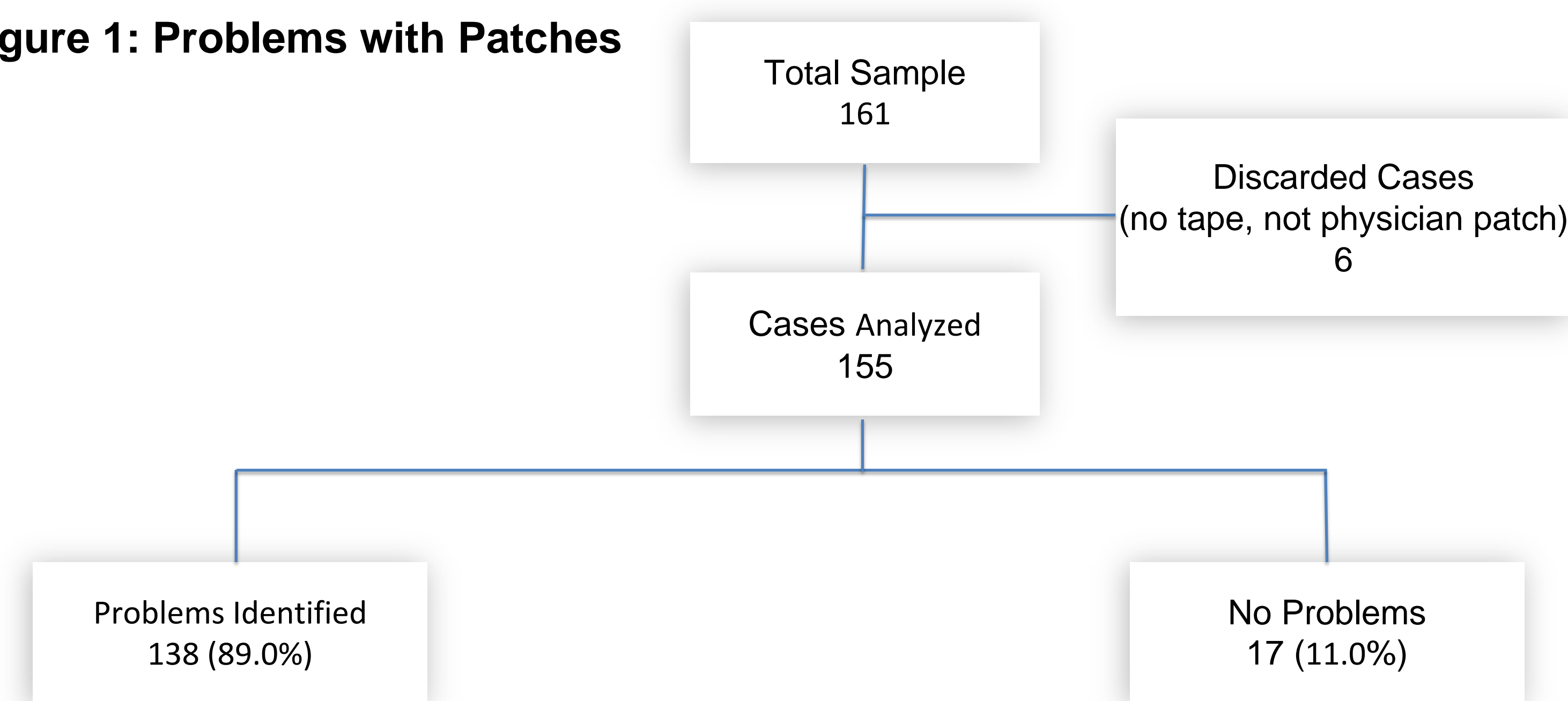
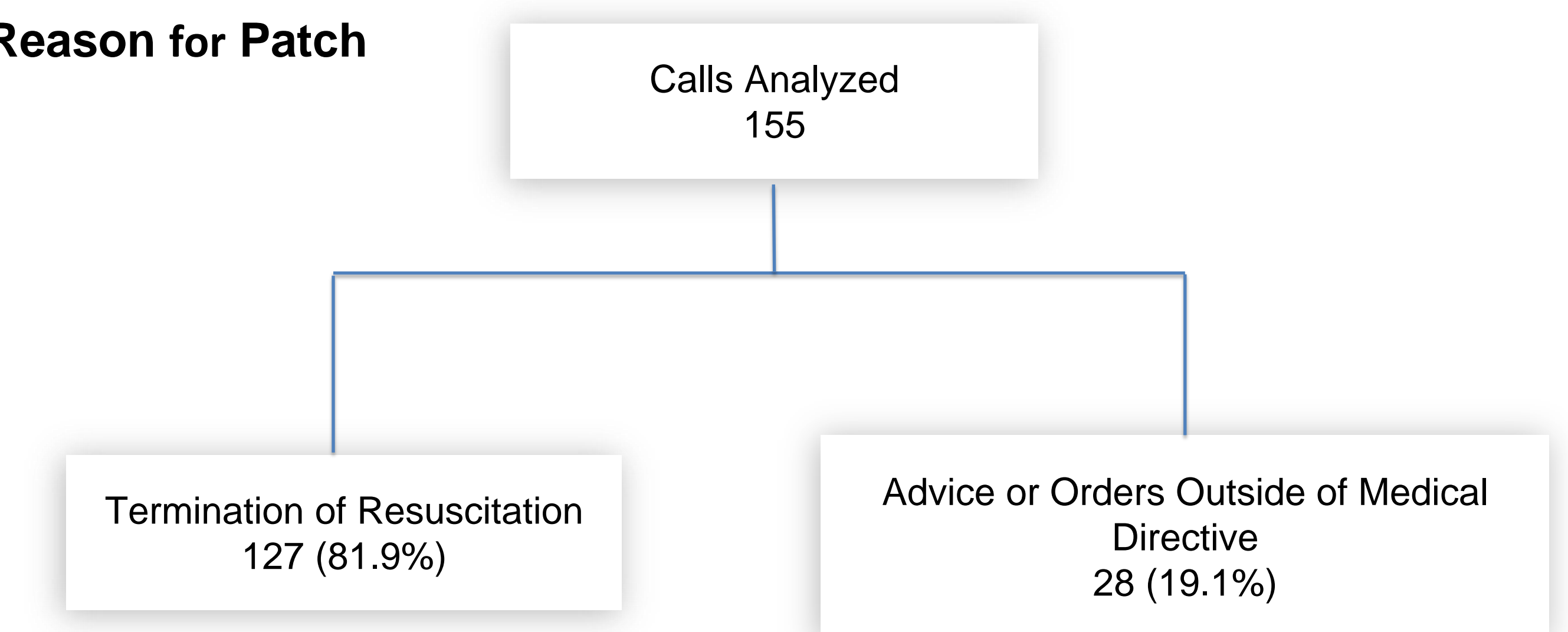


Table 1: Thematic Framework

Technical Problems Related to Cellphone/Radio Technology	Human Technique Problems Related to Poor Cellphone/Radio Technique
Difficulty Hearing (mumbling, low volume, accents, poor reception, background noise) 88 (56.8%)	Interrupting Each Other 53 (34.2%)
Disconnections 21 (13.5%)	Simultaneous Talking 85 (54.8%)

Figure 2: Reason for Patch



Factors Contributing to Communication Breakdown - Observations From the Data

1. use of cellphone technology - did not allow hearing each other during simultaneous talk
2. failure to clearly signal the end of a person's turn speaking - e.g. stops talking rather than use expressions such as "over"
3. asking a question using rising pitch of voice rather than asking a grammatical question e.g. "He is in asystole?" instead of "Is he in asystole?"
4. misunderstanding a question resulting in inappropriate response e.g. Q: "what is the heart rate? A: "156 over 82"
5. use of erratic and idiosyncratic phonetic alphabet when spelling e.g. A, B as in bear, C - instead of the military phonetic alphabet - Alpha, Bravo, Charlie, etc.
6. not 'hearing' or processing information already given - asking for information already provided - this led paramedics to provide more details when repeating information in order to "sell" the case for a particular decision e.g. "there is vomit all over the floor" in the case of a cardiac arrest
7. asking questions for information unnecessary to make a specific decision
8. spending longer than necessary on patch- kept patching paramedic out of the action of a call

Conclusions

1. Paramedic-physician telecommunication problems are extremely common
2. They involved technology problems (inadvertent disconnections, difficulty hearing) and human factors (disorganized radio 'technique')

Implications

1. Critical clinical decisions (e.g. ceasing resuscitation) depend on clear communication.
2. The high incidence of telecommunication problems identified is concerning
3. Improvement in cellphone/radio technology might be possible.
4. Poor human cellphone/radio technique should be able to be modified with attention and training to improve communications.