

Design for Six Sigma in Disaster Medicine Curriculum Development for Emergency Medicine Residents

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Introduction

Although disaster medicine may be an important part of residency training in emergency medicine, many residency programs do not have a structured disaster medicine curriculum. Rather than simply designing a curriculum by consensus, use of the design for six sigma business process management technology – which emphasizes creation of product solution based on customer needs - may allow a more structured approach to curriculum design. The present study describes the use of design for six sigma to create a disaster medicine curriculum for emergency medicine residency training.

Methods

The project team included two physicians with training and expertise in disaster medicine, and the assistant program directors from the two emergency medicine residency programs at the University of Alberta. The project followed the design for six sigma phases of Define, Measure, Analyze, Design, and Verify. During the Define phase, seven residents attended a focus group to reveal their initial impressions of their needs for a disaster medicine curriculum. Ideas from the focus group were used to create a survey instrument. During the Measure phase, twenty residents completed the survey instrument. In addition, twenty-one residents completed a pre-test in disaster medicine to determine which areas were common gaps in knowledge. During the Analyze phase, data from the focus group was analyzed using a tree diagram, while pretest and survey data was analyzed using Pareto analysis. During the Design phase, results of the tree and Pareto analysis were used to design a curriculum. The Verify phase, which is now ongoing, will apply this curriculum to the next cohort of residents. Further study of the efficacy of the new curriculum is ongoing by a questionnaire on resident satisfaction and changes on the pre and post test scores.

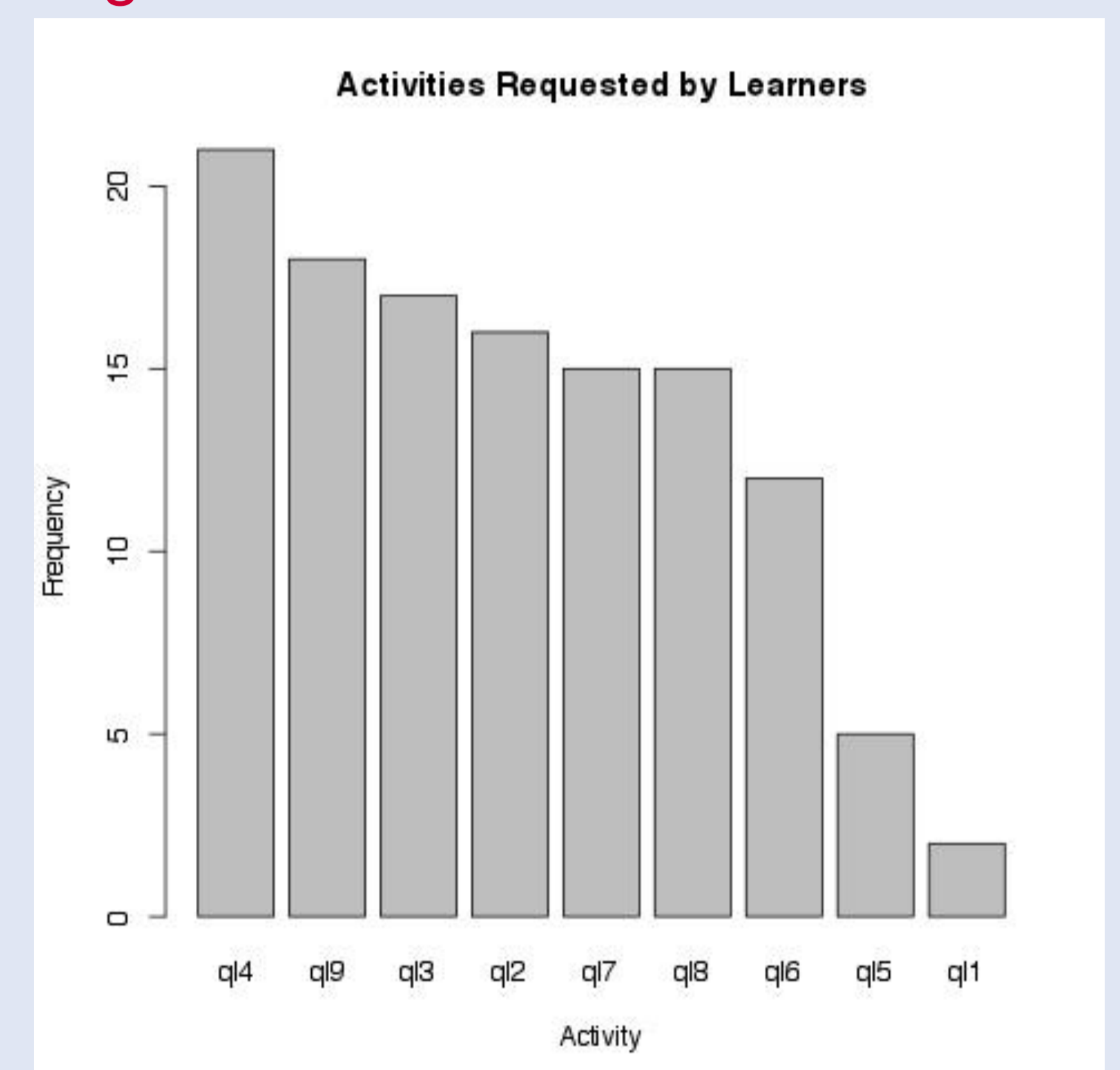
Results

The focus group revealed that residents feel disaster medicine training is important and should receive more emphasis during the residency program. They also voiced a strong preference for independent study and a focus on exam preparation. In the needs survey, residents voiced a strong preference for four type of learning activities: computer simulation, seminars with a disaster medicine instructor, lectures, and sample exam questions. (Figure1) Topics most requested by learners are shown in Figure 2. Pretest scores were highest for the topics of disaster management, definition of terms, and risk analysis, while scores were lowest for the topics of historical perspectives of disasters, psychosocial aspects of disasters, and philosophy of disaster medicine. (Figure 3) The final curriculum includes: 1) yearly computer simulation emphasizing emergency department disaster management, 2) once yearly didactic presentation on disaster medicine at emergency medicine grand rounds, 3) a set of sample exam question modules that residents will complete independently during their Emergency Medical Services rotation, and 4) a seminar with a disaster medicine instructor to review problems with the written exam questions and perform a short practice oral exam. Content of the curriculum will be focused on addressing those areas most concerning on the pre-test instrument

Conclusions

The design for six sigma technique was easily implementable for the creation of a new curriculum in disaster medicine. By providing a structured approach to definition, measurement, and analysis prior to design, the curriculum may be better suited to the needs of the residency training program. Further study is ongoing to verify its efficacy

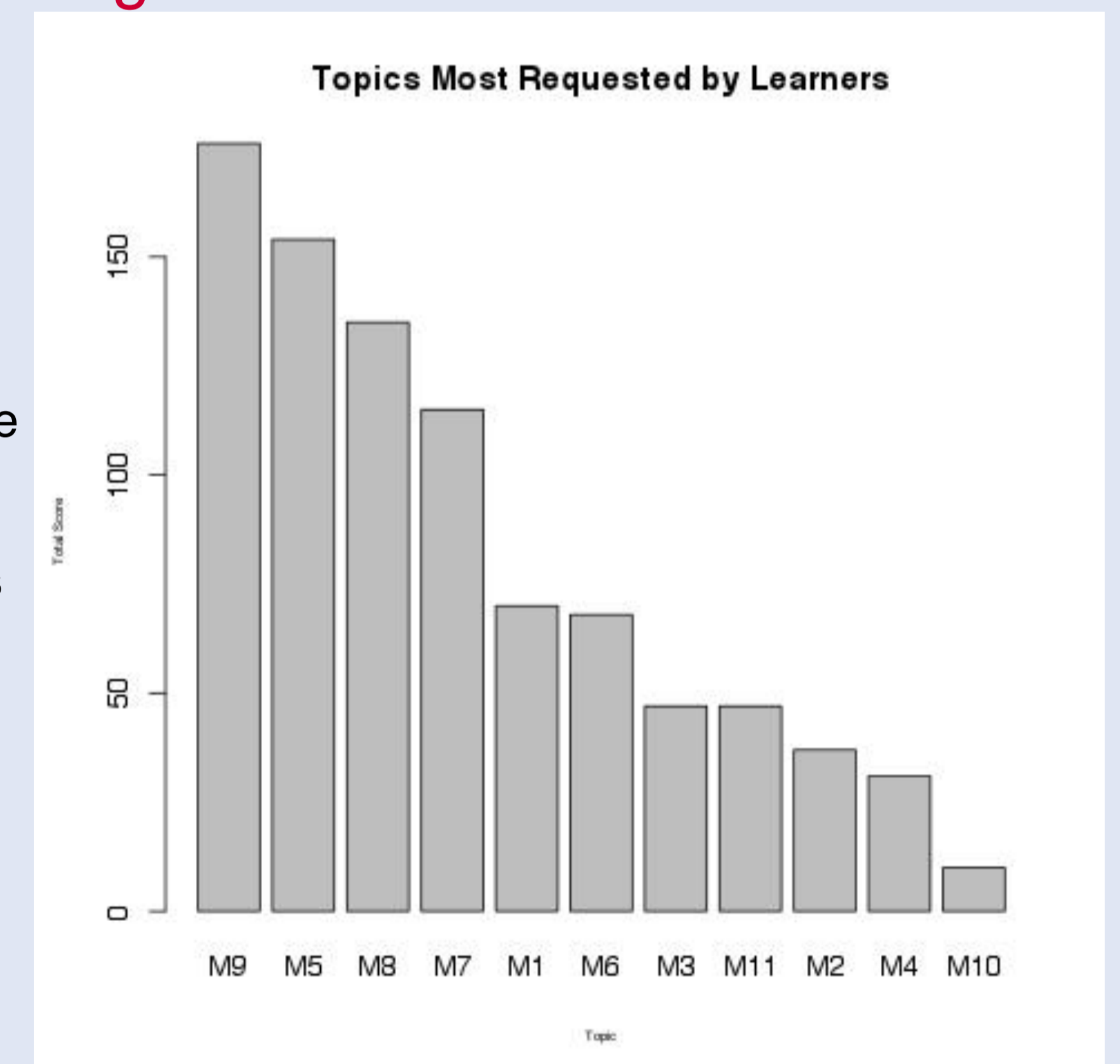
Figure 1



Legend

Q14 – Computer Simulation
Q19 – Seminar
Q13 – Lectures
Q12 – Exam Questions
Q17 – Tour of Facilities
Q18 – Small Group Sessions
Q16 – On Call for MCI
Q15 – Group Project
Q11 – Independent Project

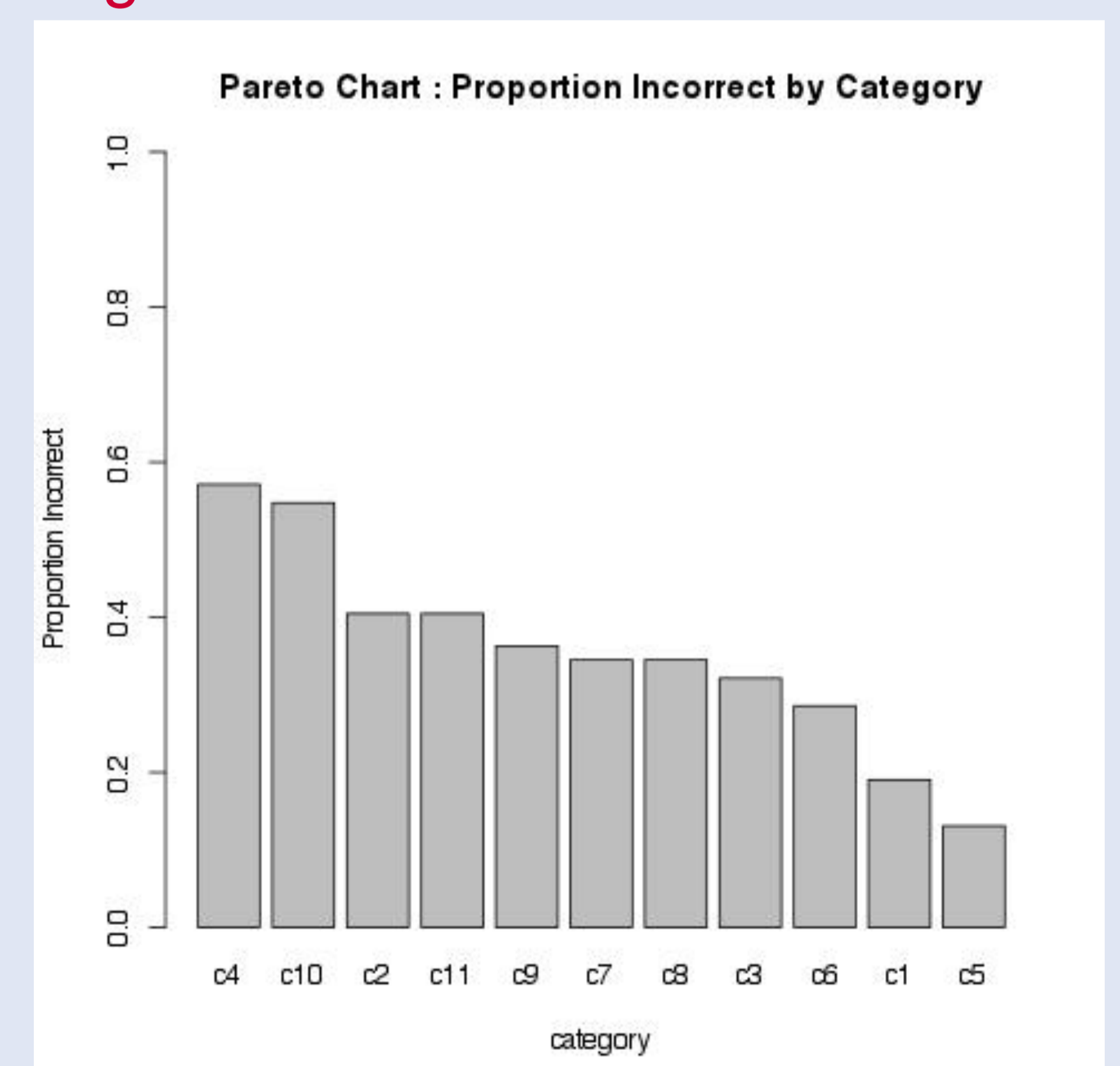
Figure 2



Legend

M9 – Medical Management
M5 – Disaster Management
M8 – Hospital Disaster Plans
M7 – EMS Disaster Response
M1 – Definition of Terms
M6 – Risk Analysis
M3 – Description of Disasters
M11 – International Disasters
M2 – Philosophy of Disasters
M4 – Historical Perspectives
M10 – Psychological Aspects

Figure 3



Legend

C4 – Historical Perspectives
C10 – Psychological Aspects
C2 – Philosophy of Disasters
C11 – International Disasters
C9 – Medical Management
C7 – EMS Disaster Response
C8 – Hospital Disaster Plans
C3 – Description of Disasters
C6 – Risk Analysis
C1 – Definition of Terms
C5 – Disaster Management