

SEISMIC CODE ADOPTION AND ENFORCEMENT IN THE
CENTRAL UNITED STATES: A SURVEY OF LOCAL JURISDICTIONS

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ABSTRACT

The earthquake risk in the New Madrid seismic zone (NMSZ) is not confined to one state, but is regional in nature, directly affecting portions of seven states. Building codes with seismic design components are an effective mitigation measure and have been gradually adopted in the majority of the seven most vulnerable states. Recent research by Olshansky (1992) has identified state governments in the NMSZ with seismic building codes. In order to comprehensively assess the awareness and extent of seismic building codes not only at the state level, but also at the local level, a survey of both state and selected local governments was conducted, to identify the current status and possible future policies of seismic code adoption and enforcement. One important goal of the study was to assess local awareness of state mandated seismic codes, which has implications for the effectiveness of information transfer of other state earthquake hazard mitigation policies.

Information obtained from the survey provides a data base useful for identifying where the transfer of earthquake mitigation policies from the state to the local level may be deficient, with implications for future planning to ensure that mitigation policies are being effectively transferred to the local level.

INTRODUCTION

Identification of the earthquake risk in the central United States has been an evolving process, occurring primarily over the last twenty years. Research by the late Otto Nuttli (1973)

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Cities

Selected cities were surveyed to check whether state-mandated codes were in compliance in areas that may not have been under county jurisdiction, and see if somewhat vulnerable cities in states with no codes had independently adopted them.

Of the eighteen mid-sized and large cities surveyed in the region, responses were received from eleven, a 61% response rate. All cities in states with state-mandated building codes have either complied with the state code, or have their own building codes with seismic design standards. For the two states with no state-mandated code no response was received from Mississippi, and in Illinois there was a split; Carbondale, in the south, had adopted a code with seismic standards while Peoria, further north, had not.

Counties

Responses from the county level were surprising. Five of the seven states surveyed in the region have state building codes. Yet only 39% indicated they were in a code adoption region, 61% indicated they were not (Figure 1). The states with recently adopted codes or no codes had the highest percentages, but even in states with longstanding building codes a surprising 22% of responders in Kentucky thought they were not in a code adoption region and 12% in the state of Indiana agreed (Figure 2). When asked if the local jurisdiction had the same code as a city, county or state 27% said yes, 48% said no and 25% didn't know or didn't answer (Figure 2). We expected states with recently adopted building codes to have some local jurisdictions that had not complied with the state mandate, but we thought nearly all would be aware of the state code. This was apparently not the case. We also were curious about the presence of local building codes, reasoning that some had probably been in place prior to the adoption state-wide codes, but 86% of the respondents indicated there were no local building codes (Figure 1) and 84% indicated there was no seismic code being adopted (Figure 2). It appears there is some confusion at the local level about the meaning of a state code with seismic design criteria, and its applicability at the local level. There are also implications in this response about the structural integrity of local building stocks constructed with what appears to be no prior code guidelines. Generations of buildings may exist in the central United States that are far more vulnerable to earthquake damage than previously estimated.

The question about monitoring seismic code enforcement was also apparently confusing to some responders. Only 16% indicated there was a monitoring process, while 3% indicated there was little enforcement of the code. Nearly half of the responders, 45%, indicated there was no seismic code enforcement, but 37% either didn't answer the question or didn't know. Regarding plans to adopt a seismic code in jurisdictions with none in place, an overwhelming 85% had no plan to implement a seismic code (Figure 3).

Because risk from earthquakes in the central United States is regional we were curious to see if there was an interest in the concept of an accordant regional seismic code. Only 4% responded with a firm no, while 27% indicated they would like to see such a policy, 15% would consider it, and 20% hadn't discussed it with anyone. Of the total number of respondents 34% had no comment on this issue (Figure 3).

The last question asked for general comments on seismic code adoption and enforcement in the region. While 73% of the responders had no comment, the comments we did receive provide some insight into building code concerns in a cross section of counties in the region (Figure 3).

CONCLUSION

The adoption of seismic building codes in the central United States is an important step forward toward the long term goal of regional earthquake hazard mitigation, but it appears there exists a considerable gap between state and local levels in knowledge of the existence of codes, which has implications for their implementation and enforcement. This may be a short term problem in the states of Arkansas, Missouri, and Tennessee, all of whom have adopted codes within the last two years. Information about state code requirements and enforcement may not have had adequate time to permeate to all local levels, and time frames for compliance exist that have not yet expired. Indiana and Kentucky, which have had state-mandated codes since the 1970's, seem to still have some local jurisdictions either unaware they are in a code adoption region or have no building codes. Further research needs to be done to establish whether discrepancies between these states laws and local jurisdictions do, in fact, exist.

The range of local officials who responded to the survey was far greater than we had anticipated, and gives some indication of who may be responsible for building code issues at local levels. Only 24% of responders were zoning administrators, the remainder were county judges, county administrators, and emergency management officials. It is interesting that 17% fell into various other categories such as secretaries, clerks, and untitled responders (Figure 1). It appears that many of the surveys were passed around until a willing respondent was located. Whether this is an indication of a lack of designated code officials at the county level is an open question. Some of the apparently contradictory responses may also be the result of the variety of officials who responded. The large percentage (85%) of responders who indicated there were no plans on having a seismic code conflicts with the 42% who indicated they would like to adopt a regional accordant code or would consider it. This may also be a further indication of confusion at the local level about the whole issue of codes. We were also interested in gender distribution of the officials we surveyed and found that 90% of the respondents were male, a possible indicator that women have not yet managed significant inroads into local public official networks in the central United States (Figure 1).

The question can be asked whether we achieved the objectives of the research. The answer is both yes and no. We have some indications of the possible levels of awareness of state mandated codes at the local level; we have a profile and a data base of local officials who may handle building code issues at the county level, (but we did not learn exactly who was responsible for building codes in all counties surveyed) and in some cities; we have an idea which counties in the region may be having some difficulty in understanding the implications of a state code at the local level. What was not achieved in this study was a clear understanding of the process of code enforcement at either the state or local level. This clearly is one of the areas that need further research.

It appears from this study that the transfer of building code information from the state to the local level is not consistent. This certainly is an area that also needs further study, and if the process of information transfer does prove to be defective, the question of how many state earthquake hazard mitigation policies are really being implemented at the local level becomes a very large one indeed. If local communities are not involved in the mitigation process as fully as the state, then much of what is occurring at the state level becomes negated. It is very important that local communities are an active and ongoing link in the mitigation chain. Clearly, much needs to be done to understand how well this overall process is occurring. The most vulnerable states in the

central United States have made commitments to long term hazard reduction, even those with no state-mandate building code as yet. The next step is to ensure that all local jurisdictions are also part of the commitment process.

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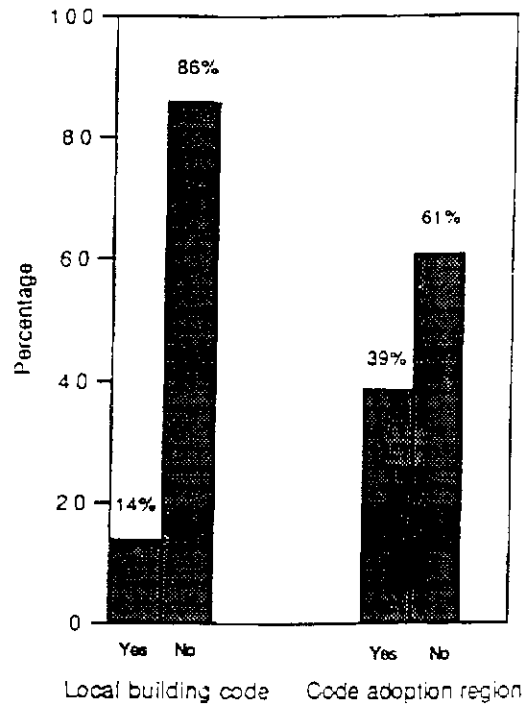
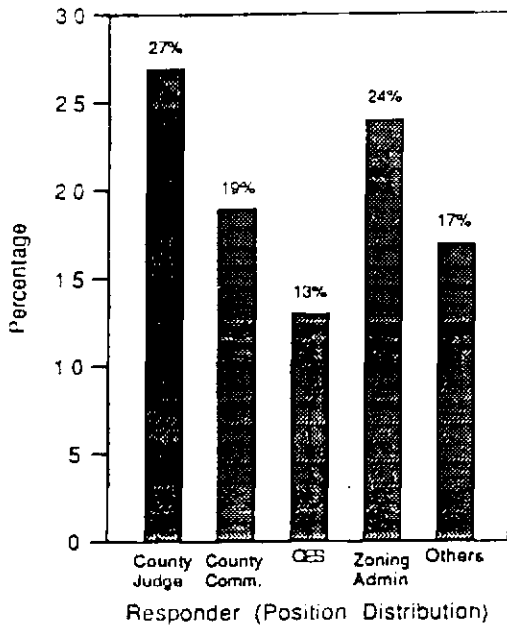
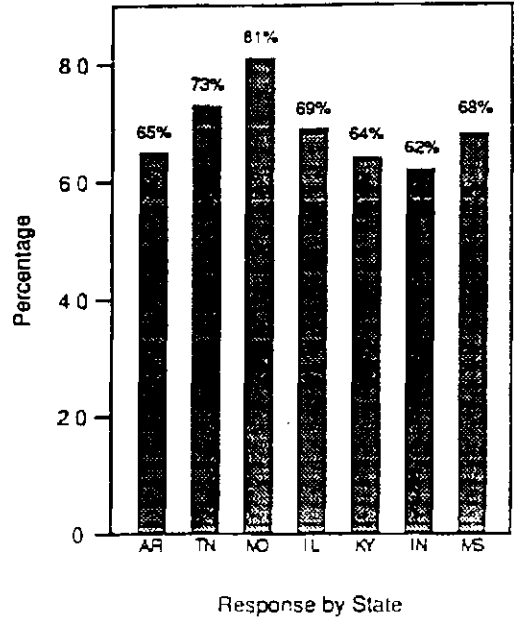
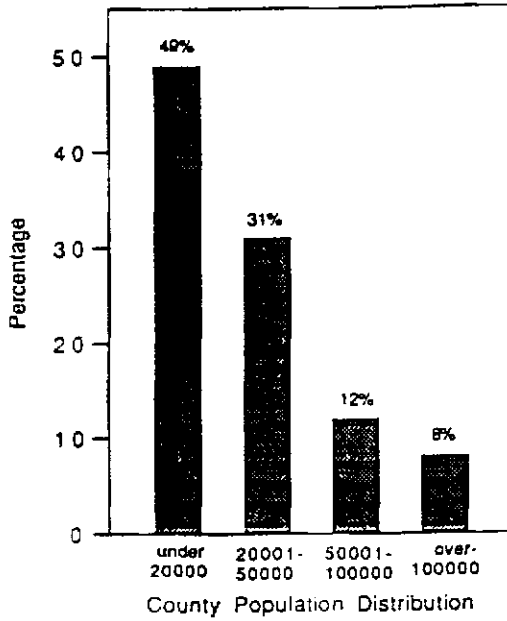


Figure 1.

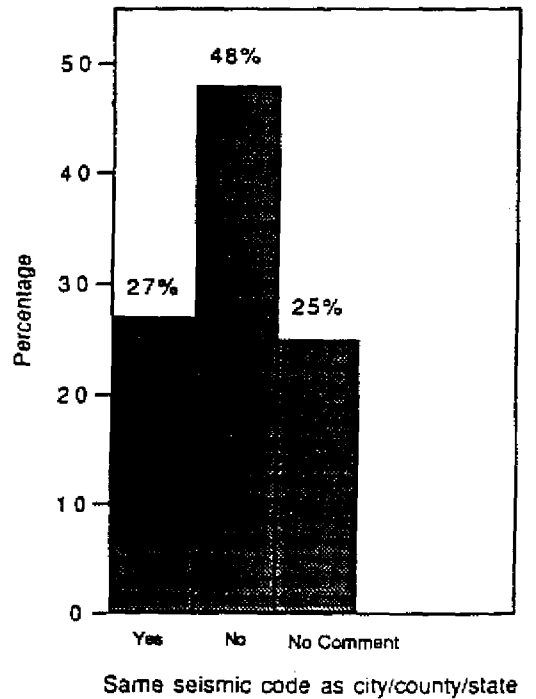
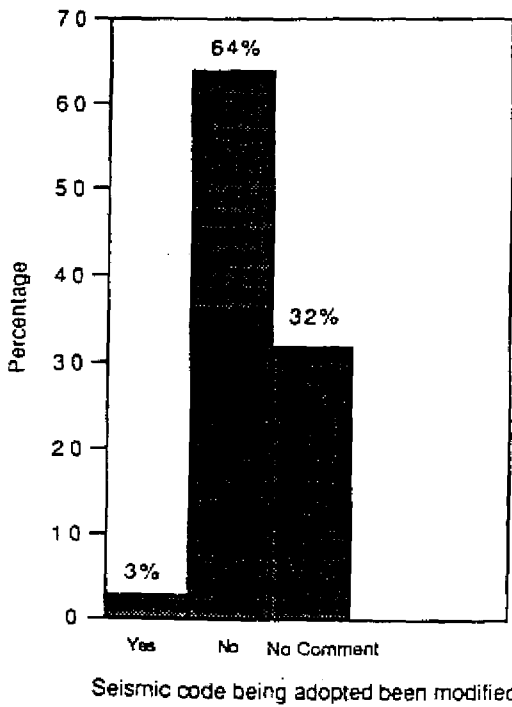
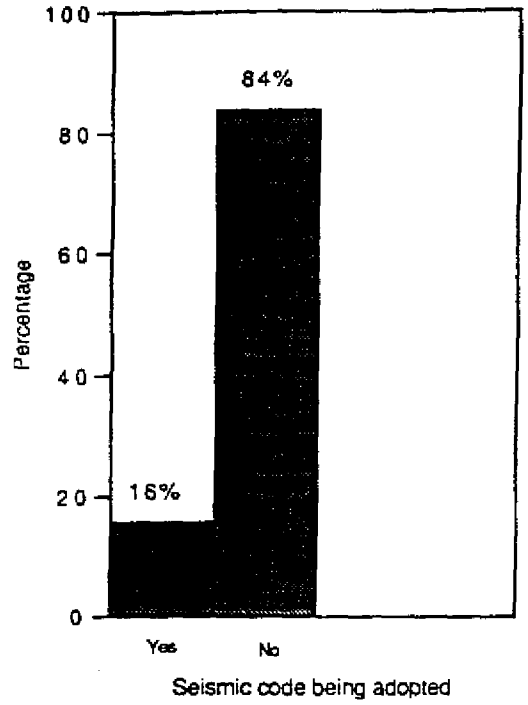
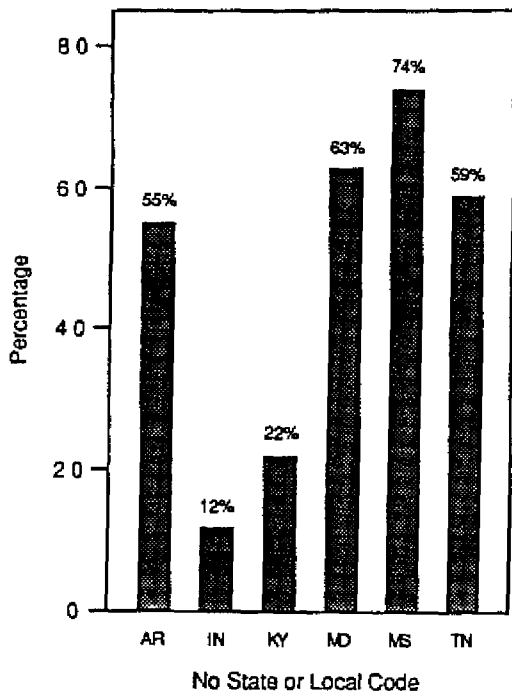


Figure 2.

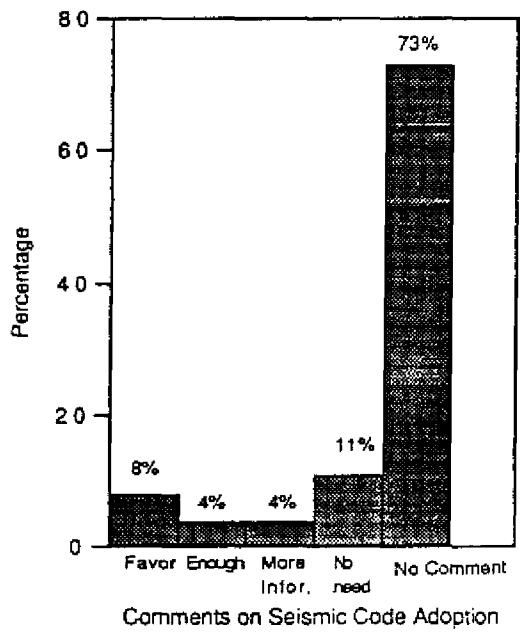
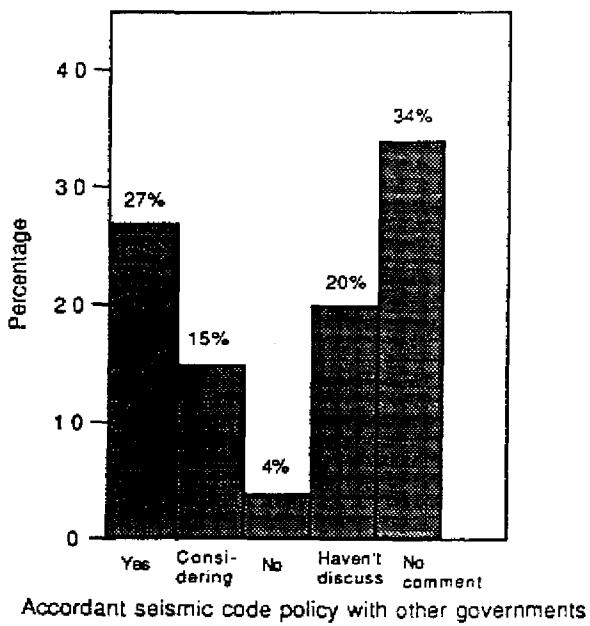
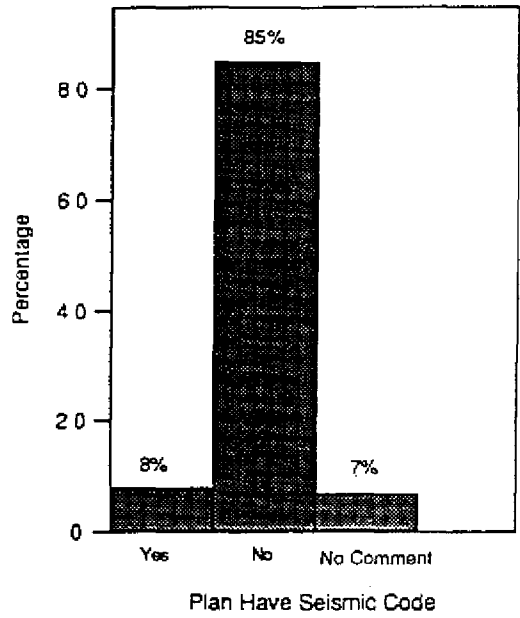
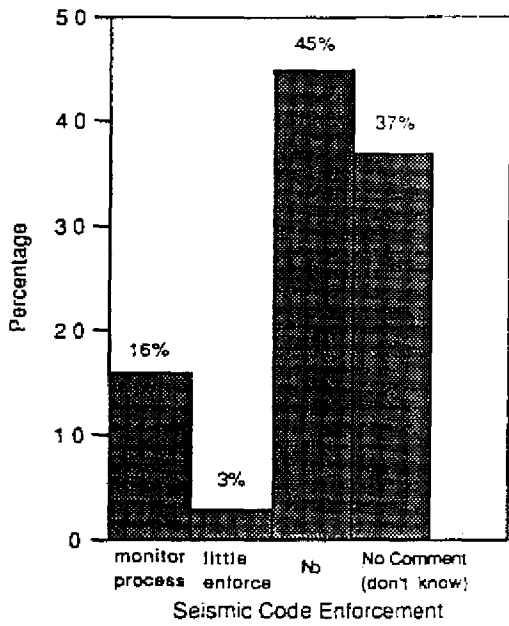


Figure 3.