
**Risk management for
cultural heritage**

RIZIK – a risk management survey for Croatian museums geared towards the better assessment, prevention and reduction of risk

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Libellarium 13, 1(2022): 17–30

UDK: 069:005.334(497.5)"2020/2021"

Original Scientific Paper / Izvorni znanstveni rad

Primljeno / Received: 9. 11. 2021.

Prihvaćeno / Accepted: 6. 6. 2022.

doi:10.15291/libellarium.3475



Abstract

Purpose. The aim of the survey on risk management in Croatian museums was to collect comprehensive data on the preparedness of Croatian cultural organisations for various risks in order to better assess, prevent and reduce risks.

Approach and methodology. Against the background of the devastating damage caused by the March 2020 earthquake to cultural heritage in Zagreb, Croatia, the International Institute for the Restoration of Historical and Artistic Works, IIC-Croatian Group, conducted a national survey under the name of RIZIK. The online survey included 73 questions divided into four categories: general information about the institution, the property including buildings and collections, followed by questions on finances and audience. Questions on safety and regular maintenance, work and business plans, essential emergency services in case of danger, possible hazards and risks affecting the buildings and the collection, along

with questions on measures that can help prevent or minimise risks and damage to the collection, the building, staff, and visitors, are part of the survey.

Findings. As many as 188 museums were invited to participate in the survey, more than 100 responded, although some answered the questions only partially. This paper shows a cross-section of the general situation in Croatian museums, addresses the problem of modernising exhibition and depository spaces, describes the idea behind the survey, and discusses its results and possibilities for enhancement.

Originality/value. The RIZIK survey is the first risk management survey sent to all museum institutions in the Republic of Croatia. The collected data are an important first insight into the current state and standards in Croatian museums, galleries and collections. Based on the results obtained, the survey participants can identify areas where they can strengthen or change their work practices, organisation and further planning.

KEYWORDS: cultural heritage, earthquake damage, long-term prevention, risk assessment survey

1. Introduction

We work with and are responsible for our common cultural heritage, which we develop and preserve for the future through the conscientious use of heritage collections. In this work, we spread awareness of our cultural heritage on the one hand and increase its value on the other. It is essential to ensure that there is no loss of value and materials, or at least to minimise such loss as much as possible (Brokerhof, Ankersmit, and Ligterink 2016; Pedersoli, Antomarchi, and Michalski 2016; Will and Meier 2007).

Cultural heritage management and outreach means making the right decisions on investment priorities, resource allocation, and minimising all kinds of risks. Risks can manifest themselves in the form of mild continuous processes whose effects are not immediately noticeable. However, they can also be catastrophic events that lead to devastating damage. By identifying and assessing risks in the form of harmful events or processes and their consequences, we can make a major contribution to the long-term preservation of our cultural heritage (Rose, Hawks, and Waller 2019).

A professional, structured and well-documented approach to risk identification is important for every cultural institution (Waller 1994, 2019; Soley 2017; Pedersoli, Antomarchi, and Michalski 2016). An innovative method of providing concise practical information on how to protect collections in emergencies was the invention of a simple paper-based tool called the Emergency Response and Salvage Wheel, in the 1990s.

Various categories are used to describe and classify risks and change factors in cultural property. These categories are based on the probability, frequency, or progression of the hazard. Specific risks need to be defined broadly enough to cover the full range of individual risks, but also clearly enough to allow for quantification. Furthermore, a single risk, such as physical damage to organic materials, may be influenced by many general risks, such as sporadic or continuous exposure to pollutants, continuous exposure to adverse temperatures and adverse relative humidity (Brokerhof et al. 2005; Ryhl-Svendsen and Thickett 1971). The collections of many museums contain substances which pose a potential chemi-

cal hazard; they usually occur either in a pure form or as a component in a mixture and need to be assessed separately. Separate measures usually also need to be considered for such substances (Ljubić Tobisch 2016).

On March 22, 2020, an earthquake measuring 5.5 on the Richter scale hit Zagreb and its surroundings (Figures 1-2). It caused significant damage not only to historical buildings, but also to small and mid-sized objects in both indoor and outdoor collections (Pavić 2020; Podany 2020; Damjanović 2020, 2021). Immediately after this natural disaster, the International Institute for Conservation of Historic and Artistic Works - Croatian Group (IIC-Croatian Group) supported several initiatives for damage assessment and structured management of the earthquake damage. Colleagues around the world were shocked by the images taken in museums and churches, where enormous damage was revealed not only to the buildings, but also to museum and church inventories (Podany 2017).

In the protection of objects, especially from natural disasters, object-adapted displays in exhibition rooms and appropriate showcases play a significant role (Henderson and Nakamoto 2016). Although few museums in Croatia are housed in a purpose-built building, it is important to mention that the right choice of building technology, materials, and storage systems, as well as the proper application of these elements, can have a significant impact.

Heritage collections require the development of suitable and affordable solutions for the preservation of the majority of objects, and the development of special solutions for the preservation of the most at-risk objects with specific needs. Many guidelines for a healthy environment with extensive information on optimal technical and climate conditions based on both scientific research and the personal experience of professionals have been developed for many years (Poggendorf 2010; Michalski 1990; Prislán, Cerar, and Zivkovic 2014). Regular maintenance, personal care, and our sense of responsibility for cultural assets are decisive in long-term preservation as well. The specific aspects of object behaviour - singly, in homogeneous or in heterogeneous object groups - should be considered in the development of individual, risk-reducing strategies for small and large museum institutions.



Figure 1. Museum staff evacuating and packing objects after the earthquake
(Source: Museum of Contemporary Art in Zagreb documentation)



Figure 2. Conservator assessing the condition of artefacts after the earthquake (Source: Museum of Contemporary Art in Zagreb documentation)

1.1. RIZIK survey distributed to museums

After the devastating damage caused to cultural heritage in Zagreb, Croatia, by the March 2020 earthquake, the International Institute for the Restoration of Historical and Artistic Works IIC-Croatian Group designed a national survey called RIZIK and distributed it to the museums (Figure 3). The aim of the survey was to collect comprehensive data on the preparedness of Croatian cultural organisations for various risks (Prislan, Cerar and Zivkovic 2014; Trust 2012). The RIZIK survey provides an opportunity for museum directors, curators, conservators and responsible staff in libraries, archives, and other cultural heritage institutions to evaluate their awareness of potential risks and their organisation's preparedness for these risks. By taking part in the RIZIK survey, an institution profile can be created. The profile will highlight the areas that demonstrate good awareness and organisation and those where



Figure 3. The cover image of the RIZIK survey (Source: Valentina Ljubić Tobisch, Maja Curman)

improvements need to be made. Furthermore, RIZIK provides guidelines that help to develop better awareness and strategies for dealing with risks resulting from the everyday operation of museums.

The purpose of the RIZIK survey is to collect, for the first time, information on awareness, readiness, and preparedness for the particular risks that cultural institutions face across Croatia. The data will form a basis for compiling a statistical overview of the current conditions across the country.

In the event of a disaster, but also in the case of lesser hazards and risks, staff should be able to act quickly to limit the damage to collections, address the cause of the emergency, stabilise the environment, assess the extent of the resulting damage, and salvage and stabilise damaged or endangered objects (Canadian Conservation Institute 1995). The results of the survey will be used as a basis for further studies, development, and work on improving the risk-prevention system, especially in high-risk areas.

2. Recognising risks and finding safety solutions

The influence of conservators on the objects in heritage institutions is not limited only to conservation measures directly applied to the materials themselves. It goes beyond conservation treatments and includes a great deal of planning, monitoring, and foresight (Ashley-Smith, 1999). Numerous preventive activities are also part of their responsibilities. When confronted with emergency situations, it is extremely important to be prepared to act promptly and according to a pre-designed plan.

Croatian museums are mostly situated in buildings that were not built specifically with this purpose in mind. Consequently, these museum buildings require a certain re-adjustment in order to ensure the desired conditions, which include a safe environment for people and collections. To accomplish this goal, it is necessary to invest time, effort, and money. Experience has shown that even the small number of museums that are located in purpose-built buildings should invest more in risk prevention, and that the most common reason for not doing so is the lack of financial resources. However, it has been shown that even a small increase in the efforts and funding invested in risk protection leads to a considerable improvement. Investing in risk assessment and risk management is sometimes expensive at the beginning, but cost-effective in the long run. It enables long-term protection, the feeling of safety and economical maintenance for a long time. A secure building means a safer collection as well, but in order to ensure maximal protection it is important to understand the specific needs of the different objects, both individually and within the storage or exhibition space. A collection survey with the aim of understanding the critical and most fragile points of the collection requires a detailed investigation and its findings would lead to significant safety improvements. It is time-consuming and involves the participation of different museum professionals mostly occupied in a wide variety of tasks, but it is worth paying attention to this segment of management.

According to some studies, there are two kinds of risk: manageable risk and pure risk (Brokerhof et al. 2016; Griffith 1994; Rose et al. 2019; Waller 2019, 1994). Pure risk refers to risks which cannot reasonably be avoided or diminished (for example, a visitor falling and sustaining an injury in the museum). Manageable risk, on the other hand, can and should



Figure 4. *The Kožarić Atelier after the earthquake* (Source: Museum of Contemporary Art in Zagreb documentation)

be reduced as much as possible. This includes natural disasters such as earthquakes, fires, floods, tornados, damage caused by people (vandalism or theft, for instance), and neglect on the part of custodians. Most of the potential risks are the result of the environment and inappropriate manipulation or treatment.

For example, the effects of the earthquake in the Kožarić Atelier, a part of the permanent display in the Museum of Contemporary Art in Zagreb, taught us a very simple but important lesson. Since the Atelier has a dynamic life, in keeping with the artist's concept, with objects changing position on the shelves or being replaced with Kožarić's other artworks and moved to the museum's storage, some of them were not fixed with museum wax immediately after the changes were made. Then the earthquake struck the city. Five artworks out of the thousand on display fell to the floor and suffered serious damage (Figure 4). A method of protection as simple and cheap as applying museum wax saved all the artworks except for five works made of plaster. In many cases, the solution is neither expensive nor complicated.

3. Methodology

3.1. Concept of the RIZIK survey

To better understand the circumstances concerning risk management in Croatian museums, IIC-Croatian Group designed and conducted an online survey. This is the first comprehensive risk study on the general state, challenges, and preparedness for multiple risks in Croatian museums and their repositories. The study, entitled RIZIK, was sent as an online questionnaire to all museums in Croatia, except private and liturgical collections. A total of 188 collections and sub-collections with their own sites were contacted, although in some cases they have an organisational affiliation. The intention was to collect data for each museum site separately, because technical and exhibition conditions often differ between the main building and the additional sites if the institution covers several locations.

The survey consisted of 73 questions divided into four categories: general information about

the institution, the property including buildings and collections, followed by questions on finances and audience. Due to the physical, social, and political environment, all the four areas are exposed to various kinds of risks. These are broad categories within a complex structure of interconnected factors, and some overlap between categories is inevitable.

RIZIK also raises several basic questions about planning, policies, and procedures within an organisation, some of them leading on to more detailed questions about the institution's working system. At the first level, the questions are grouped in four areas covering important elements of the organisation and its business. In addition to natural disasters and a range of potentially unsatisfactory conditions, risks also include finances and management, as these dictate the application of optimal conditions and standards of care for the collections. Finally, the visitors, whose opinion and satisfaction provide another opportunity for improvement, are also represented in the survey with a set of questions.

3.1.1. *Form of the RIZK questionnaire*

The RIZIK questionnaire asks about the work system in a particular organisation, grouped in four important fields. Conceivable risk issues include physical violence, fire, earthquake, water, vandalism or theft, pests, contamination, light/UV, incorrect temperature, incorrect relative humidity, and loss, storage, and display situations. Accordingly, all the categories should be considered when designing an institution's risk assessment and prevention strategy.

However, as has already been said, the safety of an institution and its staff are not only under threat from a natural disaster and unsatisfactory conditions for people and collections. Financial management and number of visitors also play an important role in a risk-management strategy. In accordance with the above, the questionnaire included questions about:

The institution – basic information about the institution which, in addition to information on the name, address, etc., includes information on the founder / financier, legal status, and position of the person completing the questionnaire.

Assets – this includes the physical segment, such as buildings and collections, and the less tangible segment, such as information and intellectual resources, as a basis of the institution's operations and identity.

These questions relate to the maintenance of the building and all the spaces inside it in terms of upkeep, checking alarms and alarm systems, analysis and organisation of collections and storage by type of material and position, to intellectual property and education for increasing the professional competencies of staff.

Finances – the necessary balance between income and expenses.

This area includes the business plan, fund raising, own revenues and expenditure control.

Audience – people whose opinions and choices affect the success of the institution. The audience also influences the work of an institution, and museums are intended for the public, so it is important that the institution responds to expectations and examines visitor satisfaction. This area includes manner of communicating with the public, advertising programmes and monitoring quality and results as well as the safety of museum visitors. Attendance is also a revenue-generating segment.

The RIZIK online questionnaire was sent to 188 institutions in the Republic of Croatia. They were invited to fill it in anonymously, which entitled them to be informed about the final results. This offered insight into the general situation in museums, as well as an opportunity to determine their own position in the broader context and in comparison to other museums.

4. Results

Out of the 188 institutions that were addressed and invited to take part in the RIZIK survey, just over 100 participated; 73 institutions fully responded (Chart 1). It is important to add that a large number of institutions began to fill in the questionnaire but gave up after a time, and the questionnaire was not designed to be continued once the program had been left. This taught us that it is important to state right at the beginning how long it will take to fill in the questionnaire and to enable subsequently returning to complete the questionnaire. The responses received are an approximate indicator of the current situation and standards in Croatian museums, galleries and collections. The data obtained demonstrate that risk assessments for museum premises, such as exhibition spaces, workshops and storage facilities, have only been carried out in one quarter of the institutions, 26% (Chart 2). In areas where there is a significant risk of flooding, only 8% of the institutions considered special measures in an emergency plan for this genuine natural threat (Chart 3). In environments with significant earthquake risk, 5% of the total number of institutions that participated in the survey included special measures in their emergency plan (Chart 4). A larger proportion of all the institutions – 32% – reported having a building maintenance plan in place, and 33% reported revising existing building maintenance plans or plans to revise them within the coming 5 years.

4.1. Analysis of survey results

Only 13% of the institutions that fully completed the survey had carried out a risk assessment for their collections, but there are slightly more priority action plans to reduce existing risks for collections, with an overall rate of 20%. Only half of the museums have appointed a person officially responsible for the professional storage and management of the objects not on display. The museums also indicate that on average slightly less than half of the objects, 47%, are visibly marked with an inventory number. Only 30% of the museums report using laminated and safety glass exclusively. All the other museums still use plain glass or are equipped with old display cases that are made of plain window glass and have not been modernised. In all the institutions, great emphasis is placed on possible damage to different types of materials caused by unsuitable climate conditions and light. Meanwhile, institutions' intellectual property risk assessment and copyright and data protection plans are carried out in only a small number of institutions (Chart 5).

The results of the RIZIK survey suggest, that in the field of cultural-heritage preservation and management, there is a need and potential for improvement in all areas for both protection of buildings and organisation. According to the results obtained, survey participants can identify areas where they can improve or change their approach to work, organisation, and planning. New areas that may have seemed simpler and less important, such as securing, funding, and maintaining their own facilities, may now emerge as vital.

The survey-generated data were anonymously analysed for the purpose of statistically determining the situation and risk awareness within cultural heritage institutions in Croatia. The names of the participating institutions will not be published. The results were forwarded to the Ministry of Culture and Media of the Republic of Croatia (MKM) and the Museum Documentation Centre (MDC), which is involved in the systematic collecting, recording,

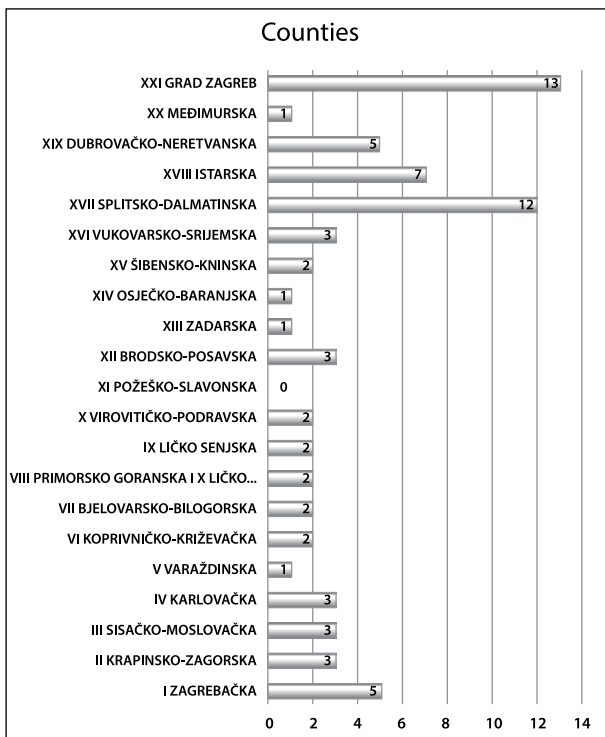


Chart 1. Responses from participating institutions by county

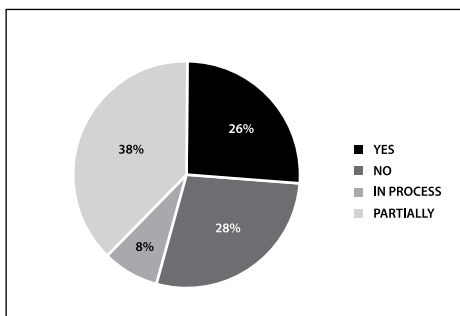


Chart 2. Conduct of risk management studies for museum premises in the participating institutions

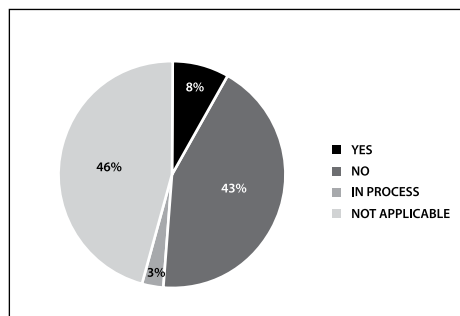


Chart 3. Consideration of special emergency measures in regions with a significant risk of flooding

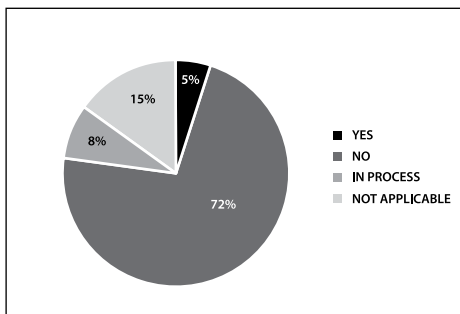


Chart 4. Consideration of special emergency measures in regions with a high risk of earthquakes

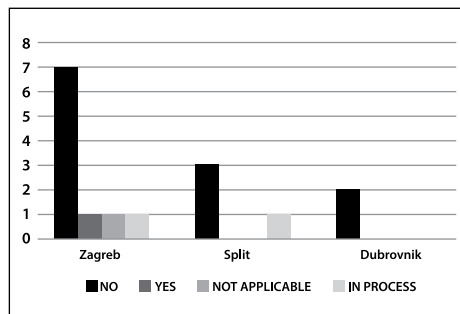


Chart 5. Risk assessment for the intellectual property of the institution

and cataloguing of material relating to museum development and activities. Both the MKM and MDC read the questionnaire in advance and approved it. The data were also forwarded to all participating museums in the form of a final report so that museum managers can get an insight into the general situation in similar institutions and the status of their organisation in terms of risk management.

5. Discussion

The first risk-management survey in Croatia was designed, implemented and evaluated by the IIC-Croatian Group. One of the disadvantages that became apparent during the study was that the survey was not sent directly to the museums by an official supervisory body such as the MKM or the MDC, although the project had their full official support. This would have increased the museums' participation in the study. Hence, the participation in the survey was on a voluntary basis. Nevertheless, the survey results provided a comprehensive reflection of risk preparedness in Croatian heritage institutions.

The RIZIK survey was designed as a complex questionnaire divided into four main thematic groups, with some of the questions developed in detail. It was intended for all, from very small, to medium and large museums. A side effect of the survey was to provide professional support, especially to museums with limited staff and thus fewer experts. In a customised risk-management study prepared for a specific institution, the questions could have been framed more succinctly. One part of the survey was based on previous risk-management studies; the other part was formulated on the basis of the damage and omissions in various collections that became visible after the earthquake in Zagreb in March 2020.

In many cases there are only enough financial resources available for the exhibition set-up, but there is often lack of funding for the appropriate depots, storage, safeguarding and long-term preservation of the parts of collections that are not exhibited. Museum management is mainly willing to finance the activities that are to be seen and exhibited in order to strengthen the museum's presence in the public eye. Objects that remain invisible often receive much less attention.

Simple actions can often result in an enormous improvement and increase in safety. For instance, shelves and dividers made of plain glass should be completely replaced by tempered or laminated glass, as they are responsible for most of the damage from vibrations (such as earthquakes). Measures such as carefully considered storage systems, clear allocation of spaces either for storing collection objects or furniture and other belongings, consistent and clearly visible labelling of storage units and objects, securing objects from sliding or tipping over, placing heavy and large objects in the lower storage units, but also regular hygienic maintenance and checking for pest infestation can all contribute enormously to the long-term preservation of cultural property.

The object of this survey was to get a credible view of the general situation of risk management in Croatian museums. The effects of the earthquake, which caused significant damage to cultural heritage, showed that risk management is an extremely important segment of museum activity. As Croatia is largely located in an earthquake belt, seismologists foresee the possibility of new earthquakes and past experience has taught us that we must be prepared.

6. Conclusion

A number of factors determine and influence the needs and working methods concerning museum collections. Each of them, with their spatial, personnel and financial difficulties, must be considered individually. People cannot change geographical location, with all its conceivable natural hazards. However, awareness of climate change must grow urgently and each of us should take responsibility for it, as without the planet, there is no cultural heritage. If we know the risks well, we can prepare ourselves and respond in the best possible manner in case of an emergency. The need for improvement of storage solutions as well as the need for gradual enhancement of preventive measures in storage and exhibition spaces is very evident from the results of the RIZIK survey. As demonstrated after the earthquake in Zagreb and in Sisak, nine months after, some simple actions and solutions can prevent damage and protect collections. These are not necessarily associated with a large financial investment. On the one hand, even simple safety measures, individually considered and consistently implemented for each object, can prevent a great deal of damage when, for example, creating displays at exhibitions. On the other hand, for natural disasters such as floods or earthquakes - especially if the geographical location clearly indicates a high-risk area - plans can be drawn up in cooperation with the fire services or civil protection, to name just some possibilities.

As a conclusion of the RIZIK survey, bearing in mind the current state of preparedness of individual institutions for risks, the construction of a central depot for multiple museums seems worth considering. One of the advantages of a well-thought-out depot in terms of building technology and professional expertise would be that each individual museum would not have to invest time, resources and money in the same considerations. With a central depot, many precautionary and safety measures could be addressed and implemented only once. The management of this depot would be in the hands of one team. Preventive measures relating to pest monitoring, climate values, delivery areas, handling of hazardous materials, loan traffic and other art transports could be handled much more easily, cheaply and safely in a central depot. Many basement and attic areas unsuitable for object storage could be cleared out and objects moved to safety. Placing this depot in a building of low-energy quality or even passive-house quality would not only save costs and provide long-term safety for cultural assets but would also contribute to a healthier environment.

Acknowledgements

The authors would like to thank all the Croatian museums that participated in the RIZIK survey – we are deeply grateful for your time, support, and interest. Our special thanks go to Agnes W. Brokerhof from the Netherlands Agency for Cultural Heritage and Jana Šubić Prisljan from the Goriški muzej, Nova Gorica, Slovenia, for sharing their knowledge and experience in risk management. Many thanks to our colleagues from the IIC Croatian Group and volunteers Petra Kolundžija and Tihomir Cvitanić for their support.

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Sažetak

RIZIK - anketno istraživanje o upravljanju rizicima u hrvatskim muzejima u svrhu bolje procjene, prevencije i smanjenja rizika

Cilj. Cilj anketnog istraživanja o upravljanju rizicima u hrvatskim muzejima bio je prikupljanje sveobuhvatnih podataka o spremnosti hrvatskih kulturnih institucija na različite vrste rizika u svrhu bolje procjene, prevencije i smanjenja rizika.

Pristup i metodologija. Nakon razornih šteta koje je potres u ožujku 2020. prouzročio na kulturnoj baštini u Zagrebu, Međunarodni institut za restauraciju povijesnih i umjetničkih djela, IIC – Hrvatska grupa, proveo je nacionalno istraživanje pod nazivom RIZIK. Mrežna anketa sastojala se od 73 pitanja podijeljena u četiri kategorije: opće informacije o instituciji, o imovini, uključujući građevinu u kojoj su smješteni muzej i zbirke te pitanja o financijama i posjetiteljima. Sastavni dio ankete činila su pitanja o sigurnosti i redovitom održavanju muzejskih prostora, radnim i poslovnim planovima, hitnim službama u slučaju opasnosti, mogućim opasnostima i rizicima koji utječu na građevinsku imovinu i zbirku, kao i pitanja o mjerama koje mogu pomoći u sprječavanju ili smanjenju rizika i štete na zbirkama, građevinskoj imovini, osoblju i posjetiteljima.

Rezultati. Ukupno 188 muzeja pozvano je na sudjelovanje u anketi, a odgovorilo ih je više od 100 premda su neki na pitanja odgovorili samo djelomično. Ovaj rad prikazuje presjek općeg stanja u hrvatskim muzejima, bavi se problemom modernizacije izložbenih prostora i čuvaonica, opisuje ideju istraživanja putem ankete RIZIK te razmatra rezultate ankete i mogućnosti unapređenja.

Originalnost/vrijednost. Anketa RIZIK prvo je anketno istraživanje na temu upravljanja rizicima upućeno svim muzejima na području Republike Hrvatske. Prikupljeni su podaci okvirni pokazatelj trenutnog stanja i standarda koji se primjenjuju u hrvatskim muzejima, galerijama i zbirkama. Sudionici ankete na osnovu dobivenih rezultata mogu identificirati područja u kojima postoji prostor za unapređenje ili promjenu pristupa radu, organizaciji i daljnjem planiranju.

KLJUČNE RIJEČI: dugoročna zaštita, kulturna baština, procjena rizika, šteta uzrokovana potresom