# 13
# Disaster Preparedness and Social Capital

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The first decade of the 21st century has pushed the field of disaster preparedness to the forefront of public health. In a few short years, the world has witnessed the far–ranging ramifications of 9/11 and anthrax (2001), SARS (2003), the Indian Ocean tsunami (2004), Hurricane Katrina (2005) and the looming threat of pandemic influenza. Societies everywhere are responding to these developments with new policies that commit added resources for protection against future disasters.

Concepts of social capital have major salience to these growing efforts. While other fields have previously explored social capital as a dimension of community integration, public health can find particular value in applying such concepts to disaster preparedness. A growing body of literature supports the integral role of social capital in all phases of disaster management i.e., preparedness, mitigation, response, and recovery. Though traditional disaster management emphasizes the value of physical, economic, and human capital, increasing research supports the notion that dimensions such as social cohesion and social networks particularly apply to preparedness work (Dynes, 2006).

In this chapter, we first comment on how social capital concepts can apply to the evolving public health world of disaster preparedness, with contributions of both bonding and bridging capital. We also explore how social capital relates not only to response and recovery phases after disasters, but just as importantly, to preparedness and planning before a disaster even occurs. While all these concepts are relevant to a broad range of disasters and emergencies, we will focus much of our attention on the current worldwide threat of pandemic influenza.

## 13.1. Applying Social Capital to Disasters

Disasters and emergencies can be characterized as natural and man-made. Medical attention to humanitarian relief has often centered on response and recovery efforts after hurricanes, floods, heat waves, earthquakes, tsunamis and other catastrophic events. Man-made disasters have received heightened public health attention since the unprecedented anthrax attacks of Fall, 2001 which affected 22 people and left 5 dead. This abrupt entrance of bioterrorism and

preparedness as critical priorities has fundamentally reshaped public health in the new 21st century. Moreover, the emergence of H5N1 avian influenza has triggered renewed concerns about a possible global pandemic. Currently, much of the world is directing renewed energy and resources toward pandemic planning.

In this context, social capital concepts offer a rich public health lens for analysis. Whether the focus is groups or individuals, social cohesion or social networks, or bonding or bridging, social capital themes drive to the heart of much of this current public health work. Furthermore, distinguishing between applying existing social capital and building new social capital offers another useful perspective for policy makers and the public alike.

In Chapter 1 of this volume, authors Kawachi, Subramanian, and Kim note that concepts of social capital have attributes related both to groups and to individuals. With respect to disasters and emergencies, such groups could include businesses, schools, religious organizations, community organizations and a host of government agencies, such as emergency management, health departments, fire departments or police departments, just to name a few. Such groups can improve disaster preparedness through collective socialization, preparation, and efficacy, e.g., formal joint training, drills and exercises, and practice of implementation of incident command systems. Individuals could range from vulnerable persons at risk in local communities to major leaders and officials in the groups noted above. At-risk individuals need to access resources through social engagement and support. Government agency leaders need to reach across to colleagues in other areas to ensure the highest levels of communication and coordination before, during and after a crisis.

Kawachi and colleagues further note that social capital can be conceptualized to include both broad social cohesion and individuals' access to resources through social networks. Once again, such concepts have special relevance to disasters and emergencies. A community with social cohesion may be better able to prepare for, and recover from, a flood than one less unified. Also individuals with ready access to support from family members and others in their community may be better able to cope with, or even avoid, the consequences of a disaster, compared to those without such networks. As one major example, Hurricane Katrina focused worldwide attention on the tragic outcomes of those without networks and resources. No doubt dimensions of social capital can influence emergency preparedness outcomes at the level of the individual, the community, the state, the country or indeed, the entire globe.

Also, both bonding and bridging social capital have complementary relevance in these contexts. As noted by others, bonding capital refers to resources accessed within social groups consisting of members alike with respect to social features such as class and race (Gittell & Vidal, 1998). With respect to emergencies and disaster preparedness, examples include strengthening local communities through better information channels and mobilization of volunteers. Meanwhile, bridging capital refers to resources built through connections made across social identity boundaries. In preparedness, such examples could include creating connections between local communities and official agencies and building trust between local residents and authorities.

## 13.2. Utilizing Existing Social Capital
## to Enhance Mitigation & Recovery

To date, literature relevant to social capital has focused largely on the value of ***existing*** social capital in disaster mitigation and recovery. For example, among environmental scientists, there is growing interest in the role of social capital and global climate change (Adger, 2001; Pelling & High, 2005). In light of the causal link between global climate change and the increasing incidence of natural disasters such as hurricanes, tsunamis and floods, researchers have identified social capital as an important tool in disaster mitigation. For example, Semenza, et al. (1996) found that during the 1995 heat wave in Chicago, in addition to location (i.e., living on the top floor of building) and access to air conditioning, variables related to social contact and networks were also strong predictors of mortality. Specifically, the authors found that individuals who participated in church or social groups had a significantly lower risk of death during the heat wave. It is clear from these findings that social networks and social capital are important tools in community coping with stresses, and serve to mitigate adverse outcomes of disasters and other events associated with climate change.

   Similarly, existing social capital has served as a vital instrument in the recovery and rebuilding efforts following numerous natural disasters. Nakagawa and Shaw (2004) hypothesized that differing rates of post-disaster recovery following major earthquakes in Kobe, Japan and Gujarat, India could be attributed to disparate levels of existing social capital in the two cities. In the immediate aftermath of the 1995 Kobe earthquake, neighborhood groups (previously formed in the 1960s to protest polluting factories) quickly reconvened to assist with school evacuation, establish community kitchens, and help protect against looting. These actions accelerated response efforts and served to initiate rebuilding.

   Following Hurricane Katrina in 2005, a number of observers (Garreau, 2005; Turner & Zedlewski, 2006) attributed many of the barriers to rebuilding New Orleans to the previously documented low social capital there (Putnam, 2000). Nevertheless, exceptions were notable. For example, within a matter of weeks, select tight-knit groups such as the Vietnamese enclave in East New Orleans were already engaged in rebuilding efforts (Hauser, 2005; Shaftel, 2006). Many of the 20,000 Vietnamese in New Orleans had previously emigrated to the U.S. in the 1970–1980s and have since maintained strong social and cultural networks. Using a church as headquarters, the Vietnamese residents of East New Orleans formed neighborhood teams to rebuild, repair, and decontaminate houses, prepare meals for families visiting to check on their property, and drive one another to work, church, and temporary housing.

## 13.3. Building New Social Capital
## through Preparedness & Response

For the preparedness and response phases of preparedness, much of the current efforts are focusing on the process of creating ***new*** social capital. One poignant illustration is the dramatic volunteer convergence on New York City following

the terrorist attacks on September 11th, 2001, documented to include over 15,000 individuals within two and a half weeks. A qualitative study conducted by Lowe and Fothergill (2003) found that the primary motivation for volunteering was a need "to contribute something positive and find something meaningful in the midst of a disaster characterized by cruelty and terror" (p. 298). The authors characterized the impact of such spontaneous volunteerism on both the community and the volunteers themselves, i.e., affecting both groups and individuals. One volunteer described the work as "honoring our commitment to the American public" (p. 303), implying a broad national community. Individual impact was noted when "the volunteers found that by working with new groups of people. . . . . they experienced a sense of solidarity with different community members" (p. 303). In another example outside of the United States, an estimated 2 million volunteers responded to assist with search and rescue, medical aid, transportation, and provision of shelter following the 1985 earthquake in Mexico City (Dynes & Quarantelli, 1990).

A major benefit of preparedness planning would be to strengthen local public health infrastructure which has been traditionally fragmented and severely underfunded. Over a few short years, nascent efforts on preparedness have broadened the initial focus on training federal and state government leaders to include local officials and indeed all members of society. Lessons from SARS and Hurricane Katrina have underscored the message that every person has an opportunity and responsibility to protect themselves, their families and their communities.

As a result, in the world of public health, emergency preparedness training now extends deeply to the local level with respect to planning, communication and training. In many parts of the United States, efforts have focused attention to regionalization of local public health, surge capacity planning, vulnerable populations, risk communication, and training through exercises and drills. All these efforts have the potential to boost local public health infrastructure and build a legacy of social capital and social networks in local communities.

The remainder of this chapter will explain in greater detail how such preparedness efforts apply to dimensions of social capital at the local level, particularly with respect to pandemic influenza preparedness.

## 13.4. Building Social Capital through Pandemic Influenza Preparedness

### 13.4.1. Planning

The threat of pandemic influenza has sparked heightened planning worldwide. The World Health Organization (WHO) urges that each country and community develop and regularly update a pandemic preparedness plan. WHO guidance centers on issues such as surveillance, communications and prioritization of scarce resources. As of December 2005, 40 countries have completed such plans

(Uscher-Pines, Omer, Barnett, Burke & Balicer, 2006). The United States unveiled its National Pandemic Influenza Plan in November, 2005, addressing areas such as domestic and international surveillance, vaccine development and production, antiviral therapeutics, communications and state/local preparedness. Moreover, each of the 50 states has developed and publicized plans, as summarized on www.pandemicflu.gov. All nations understand the importance of priority setting in preparedness planning, although such plans currently vary by rationale of prioritization of antiviral agents, vaccines and other scarce resources (Uscher-Pines, Omer, Barnett, Burke, & Balicer, 2006). As "all preparedness is local" however, such plans can only come alive through full engagement at the local level. Both bonding and bridging social capital apply throughout such plans.

### 13.4.1.1. Local/Regional Planning

The current fragmented status of local public health in the United States has left few cities or towns (aside from the major metropolitan areas) capable of responding on their own. For the most part, local health departments lack the personnel, resources or capacity to respond to mass casualties without the support of surrounding communities.

To address this challenge, many states have turned to regionalization of resources and services to build emergency preparedness capacity at the local level. A study of state public health preparedness programs conducted in Fall, 2004 by the Association of State and Territorial Health Officials (ASTHO) found that most states tended to subdivide their organizations into regions for preparedness purposes, with more than half of such regions created post-9/11 (Beitsch et al., 2006). Massachusetts, Nebraska, Illinois, Kansas and the Northern Capital Region (greater metropolitan Washington DC) are among the states that have done so. For example, Massachusetts, a state of 6.3 M, traditionally had a highly decentralized local public health system with 351 autonomous cities and towns. Nevertheless, after 9/11 the state reorganized into seven emergency preparedness regions and 15 subregions (Koh, Elqura, Judge, & Stoto, 2008). In another example, the primarily rural state of Nebraska of 1.7 M people has developed 16 regions in efforts to improve capacity.

Preliminary qualitative information suggests that regionalization has built social capital for groups and individuals. The National Association of County and City Health Officials (NACCHO) notes that regionalization has promoted *coordination* (of local public health and partners in public safety and emergency medical services), *standardization* (of resources and emergency plans) and *centralization* of local emergency response capability (Bashir, Lafronza, Fraser, Brown, & Cope, 2003; Hajat, Brown, & Fraser, 2001). In so doing, improved collective efficacy can be realized. Analyses have noted that regionalization has served as a foundation for sharing resources, coordinating planning, conducting trainings and improving capacity. For example, in Massachusetts, regionalization led to emergency local capacity essential for pandemics and mass casualties, such as establishment of 24/7 emergency on-call capacity for all local public health officials in the state (when none previously existed) and mutual aid agreements for over 60% of local

public health departments (compared to none previously). In fact, in the few short years of its existence, regionalization has facilitated the efficient organization of Hepatitis A immunization clinics in the face of food borne outbreaks, and coordination of seasonal flu vaccine distribution during the shortages of the 2004–2005 season (Koh, Shei, Judge et al., 2006). Such examples reflect enhanced social capital within groups (e.g., nurses and allied health professionals) and bridging between groups (local health groups and state public health officials).

Most notably, regionalization has fostered communication and connections between multiple groups: public health and public safety, interested parties in neighboring towns, local and state leaders, and volunteers across the state. Multiple parties that rarely worked together prior to 9/11 are now meeting regularly to plan joint responses and clarify roles and responsibilities.

### 13.4.1.2. Coordination of Health Care Assets and Surge Capacity

Planning for pandemics and mass casualties requires ramping up the current national health care system to care for thousands of extra ill patients. Building surge capacity in this way can generate bonding and bridging capital, mobilizing and unifying a vast array of societal resources. Based on past pandemics, the U.S. Department of Health and Human Services (DHHS) has modeled its pandemic planning on scenarios ranging from moderate (such as the 1957 and 1968 pandemics) to severe (such as the 1918 pandemic). Current models project as many as 90 M cases nationally, 50% of cases requiring outpatient medical care, and up to 9.9 M requiring hospitalization (Hamburg et al., 2005). The U.S. Centers for Disease Control and Prevention (CDC) has developed the software program FluSurge, which provides hospital administrators and public health officials local estimates of the surge in demand for hospital-based services during the next influenza pandemic.

The challenge of surge capacity remains enormous, as national trends over the past several decades reflect declining, not increasing, capacity. In fact from 1993 to 2003, the number of hospitals in the U.S. decreased by 703, with the number of hospital beds declining by 198,000. This drop in capacity has only added to the tremendous strain on emergency departments in the country, where visits have increased from 90.3 M to 114 M in the same time period (Institute of Medicine Committee on the Future of Emergency Care in the United States Health System, 2006).

With this daunting backdrop, the United States is working toward increasing surge capacity, explicitly defined by the U.S. Agency for Healthcare Research and Quality (2004a) as "a health care system's ability to expand quickly beyond normal services to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies" (p. 1). The U.S. Health Resources and Services Administration (HRSA) has offered surge capacity benchmarks with respect to staff, space and supplies, as shown in Table 13.1 (Agency for Healthcare Research and Quality, 2004b).

Building staff can be viewed as an exercise in creating bonding capital, i.e., within the community of health care providers. Additional personnel needed for

TABLE 13.1. Health care surge capacity benchmarks per the U.S. Health Resources and Services Administration.

| Staff | |
|---|---|
| Health Care Personnel | Response system that allows immediate deployment of: |
| | 250 additional personnel per million population in urban areas |
| | 125 additional personnel per million population in rural areas |
| **Space** | |
| Hospital Beds | 500 additional acute care beds per million population |
| Decontamination Facility | Adequate portable or fixed decontamination system for 500 patients & workers per million population |
| Isolation Facility | At least one negative pressure, HEPA-filtered isolation facility capable of supporting 10 patients per health system |
| **Supplies** | |
| Personal Protective Equipment | Adequate equipment for all health care providers, including additional personnel per above benchmark |

deployment in a crisis would include, in addition to physicians (approximately 800,000 in the U.S.) and nurses (approximately 2.2 M in the U.S.), veterinarians, pharmacists, mental health professionals and a host of other allied health professionals. Such providers would not only administer direct care to those who are sick but could also aid with mass prophylaxis efforts to the many more who may be exposed or at risk. To augment this national network, communities across the U.S. are engaging volunteers in emergency response. For example, in 2002, the U.S. Office of the Surgeon General founded the Medical Reserve Corps (MRC), a network of community-based teams of local volunteer medical and public health professionals, which now includes approximately 100,000 volunteers in over 500 MRC units (U.S. Office of the Surgeon General, 2006). Additionally, in 2002, HRSA established the Emergency System for the Advanced Registration of Volunteer Health Professionals (ESAR-VHP) whereby states are funded to establish pre-registration systems for emergency volunteer health professionals. Through both initiatives, volunteers are prospectively identified, trained, and credentialed to respond during an emergency.

With respect to space, all hospitals have been charged by HRSA and other organizations to identify additional beds for use in pandemics and emergencies. In addition to staffed beds (beds that are licensed, staffed, and physically available), all acute care hospitals are ascertaining surge capacity by identifying other beds that: are licensed but not staffed, can be made available within 24 hours (by discharging patients and canceling elective procedures) or within 72 hours (through use of non-traditional locations such as hospital cafeterias, chapels, etc.). In the event that hospital capacity is still overwhelmed, professionals across the country are currently identifying other health care facilities such as community health centers (Koh, Shei, Bataringaya et al., 2006) or even non-medical sites such schools, gymnasiums, armories, and convention centers. Considerations for such facilities include dimensions such as bed capacity, sanitary facilities, food services, and security.

The shortage of medical supplies has also prompted bridging outside the medical world to other parts of government and society to generate sufficient resources. Many have argued that preparing for pandemic influenza first entails mastering the proper coordination of national vaccination efforts for annual seasonal influenza, which yearly leads to 36,000 deaths and 200,000 hospitalizations (Thompson, Shay, & Weintraub, 2003, 2004). In particular, the fragmented nature of the national seasonal influenza vaccine supply became starkly apparent during 2004–2005, when a national low of 61 M doses led to prioritization of risk groups for immunization for the first time. Production for 2006–2007 is now estimated to reach a high of 115 – 120M doses, however (Fauci, 2006). Shortages of antibiotics and antiviral agents may require interaction with the federal Strategic National Stockpile (SNS), managed by the CDC and DHHS. The SNS contains prepackaged pharmaceutical agents that can be deployed to states at the governor's request. All states have prepared preliminary plans for the receipt and management of stockpile materials, and many have initiated planning for emergency dispensing at the local level.

Acquiring such resources and even determining the resources needed are a tremendous source of activity and controversy. One area involves personal protective equipment (PPE) where, for example, experts differ about recommendations regarding proper use of surgical masks, N 95 respirators and other equipment (Institute of Medicine Board on Health Sciences Policy, 2006). Additionally, ventilators represent a critical limiting physical resource. There are approximately 105,000 ventilators in the U.S., with as many as 80,000 in use at any given time for medical care; and more that 100,000 required during a typical influenza season (Osterholm, 2005). In the event of a pandemic, the number of patients requiring mechanical ventilation would likely exceed this capacity in excess of 500% (Hamburg et al., 2005).

### 13.4.1.3. Attention to Special Populations

All disasters expose disparities. As mentioned previously, Hurricane Katrina has been a recent disaster that has graphically highlighted vulnerabilities of special populations, the varying levels of social capital within those populations, and the need to ensure equity in preparedness. A survey revealed that 38% of those who did not evacuate before Hurricane Katrina were either physically unable to do so or had to care for someone who was physically unable to leave. 52% of evacuees reported having no health insurance coverage at the time of the hurricane (Brodie, Weltzien, Altman, Blendon, & Benson, 2006).

National groups have redoubled efforts to address the needs of special populations, defined by the CDC (2006) as "groups whose needs are not fully addressed by traditional service providers or who feel they cannot comfortably or safely access and use the standard resources offered in disaster preparedness, relief, and recovery" (p. 4). They include, but are not limited to: 1) those who are physically or mentally disabled (blind, deaf, hard-of-hearing, cognitive disorders, mobility limitations); 2) limited or non-English speaking; 3) geographically or culturally isolated; 4) medically or chemically dependent; 5) homeless; 6) frail/elderly and

children. Such groups would need to bridge to resources currently not available to them. Issues of trust in, and trustworthiness of, authorities charged to protect them further complicate this issue.

Planning for special populations has increased recently. Such planning may differ dramatically for densely populated urban settings as opposed to more sparsely populated rural settings; each community with its own profile of risks and assets. Examples of special populations planning include evacuation planning for elderly immobile populations in nursing homes, targeted risk communication strategies for non-English speaking populations, and coordination of services for people who are homeless, homebound, or medically or chemically dependent. Such populations are particularly vulnerable to broader social forces affecting their communities. Overcoming social isolation in these instances remains a daunting societal challenge.

## 13.4.2. Communication of Risk

In a time of crisis, all members of society expect and deserve accurate information that is conveyed simply, clearly, and in a timely fashion. Such information is critical not only for all to understand roles and responsibilities in times of crisis but also for how and when to access resources. In this regard, the WHO, CDC and other organizations have afforded considerable attention and resources to upgrading media plans, training of communicators, and message preparation and delivery.

To a great extent, the responsibility for such risk communication will fall on government public health authorities through broad use of the media. This presents special challenges in the U.S., where recent surveys show that less than 50% of the general public trust government public health authorities "a lot" as a source of useful and accurate information about an outbreak, compared to significantly higher levels in other parts of the world, such as Taiwan, Hong Kong and Singapore (Blendon et al., 2006).

In particular, it is unclear exactly how much the public understands the concept of "pandemic influenza" and how it differs from the term "avian influenza". Also, there are many other subtleties in communicating relevant information to the public and the press. For example, the uncertain efficacy of antiviral agents for pandemic influenza may not be well known. In Chapter 12 of this book, Viswanath explores the information disparities affecting populations in society. Building public awareness now through regular communication can enhance trust and confidence in advance of any future pandemic.

## 13.4.3. Training Emphasizing Exercises & Drills

In preparing for a disaster, professionals and the public need continuous education and training. Groups such as the federally funded Academic Centers for Public Health Preparedness have been charged with exploring many such educational avenues, including face-to-face teaching, train-the-trainer initiatives (Orfaly et al., 2005), distance learning initiatives (Moore, Perlow, Judge, & Koh, 2006) and other modalities.

Recently, the public health community has moved aggressively into exercises and drills as a favored educational modality (Cadigan, Biddinger, & Koh, 2006). Mounting a rapid, coordinated, integrated local response to mass casualty events such as pandemic influenza necessitates tight collaboration among a host of participants, including emergency management, public health, law enforcement, fire, emergency medical services, health care providers, public works, municipal government, and community-based organizations. Exercises, defined as any event beyond the planning process that gathers people to test or improve preparedness (U.S. Department of Homeland Security, 2004), both teach and test such coordination for individuals and organizations. Involving representatives from multiple agencies to exercise together in a regular fashion facilitates an iterative cycle of developing plans, training personnel, testing preparedness, and improving plans even further to clarify specific roles and responsibilities.

Both bonding and bridging capital can be enhanced in this way. For example, tabletop exercises are often organized around multiple tables, with each table representing one local municipality. Key government officials from across various agencies work together at each table, while being forced to interact with other towns/tables as well as state agencies. Resources can be enhanced by building bonding capital within each professional group, each agency, each town, as well as bridging capital across agencies, communities and between local and state officials.

Furthermore, since public health disasters are critical but rare, exercises serve the vital function of testing plans in a concrete and memorable fashion. Use of local tailored scenarios provides exercise participants with a sense of urgency as well as concrete opportunities to understand the complex coordination involved in local emergency response. Furthermore, respondents can test their understanding of the National Incident Management System and the Incident Command System. Such active, experiential learning appears to have greater educational impact than more conventional, didactic lectures, particularly for rare events (Streichert et al., 2005).

These exercises build social networks of responders. Qualitative studies suggest that exercises improve communications with colleagues from other agencies, force participants to address inadequacies in communications systems and protocols, and promote strategies to ensure presentation of consistent messages. By convening with local/regional partners, participants realize potential opportunities to increase capacity by sharing resources with neighboring communities. Bringing together participants from a range of disciplines enhances opportunity to learn about the unique services, skills, and expertise offered by others. An ongoing area of research is to quantify these outcomes in a standardized way that demonstrates enhanced preparedness.

## 13.5. Conclusion

While we offer our ideas here on the ramifications of social capital on evolving public health preparedness work, much of this information is qualitative and/or preliminary. Many observations noted here need verification and validation.

Furthermore, the intense current focus on community disaster preparedness is still relatively new. Academic investigation should verify and extend these concepts, offer more quantitative assessments of social capital as applied to disasters, demonstrate their utility through more rigorous analyses, and ascertain whether initial societal changes found in qualitative studies will be enduring and sustained. Moreover, we have presented concepts of social capital as being overwhelmingly positive in their nature when in fact research in other areas has documented possible negative ramifications noted elsewhere in this book.

Nevertheless, much of the current work regarding public health preparedness can enhance social capital through stabilization and growth of the current fragile public health infrastructure, i.e., workforce capacity and competency, information and data systems, and organizational capacity (CDC, 2001). Disaster planning has undoubtedly revived and accelerated community discussions about societal planning, obligations, and expectations in a time of crisis. Regionalization of local health has generated new local capacity. Attention to special populations has renewed emphasis on commitments to equity and raises key questions about obligations of community members to one another. Efforts to enroll volunteers through MRC and other initiatives have revitalized discussions on expectations of service in a community. Attention to surge capacity, resource shortages and the prospect of alternate sites of care during a mass casualty event has raised explicit discussions about obligations and expectations. Agencies have advanced bridging in the common mission of protecting the public. Inherent in all planning has been the importance of trust building, particularly in information sharing and risk communication.

Moreover, such investments may well be helping to build a more cohesive, integrated, prepared national and global community where all understand their interdependence in the midst of a crisis. In a time of social isolation where many are "bowling alone", disaster preparedness efforts may serve as a force that reverses this trend and contributes to a legacy of stronger local public health and a more revitalized society for the future.

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