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Barriers to implementing infection prevention and control guidelines during crises: Experiences of health care professionals

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Background: Communicable disease crises can endanger the health care system and often require special guidelines. Understanding reasons for nonadherence to crisis guidelines is needed to improve crisis management. We identified and measured barriers and conditions for optimal adherence as perceived by 4 categories of health care professionals.

Methods: In-depth interviews were performed (n = 26) to develop a questionnaire for a cross-sectional survey of microbiologists (100% response), infection preventionists (74% response), public health physicians (96% response), and public health nurses (82% response). The groups were asked to appraise barriers encountered during 4 outbreaks (severe acute respiratory syndrome [SARS], *Clostridium difficile* ribotype 027, rubella, and avian influenza) according to a 5-point Likert scale. When at least 33% of the participants responded "strongly agree," "agree," or "rather agree than disagree," a barrier was defined as "often experienced." The common ("generic") barriers were included in a univariate and multivariate model. Barriers specific to the various groups were studied as well.

Results: Crisis guidelines were found to have 4 generic barriers to adherence: (1) lack of imperative or precise wording, (2) lack of easily identifiable instructions specific to each profession, (3) lack of concrete performance targets, and (4) lack of timely and adequate guidance on personal protective equipment and other safety measures. The cross-sectional study also yielded profession-specific sets of often-experienced barriers.

Conclusion: To improve adherence to crisis guidelines, the generic barriers should be addressed when developing guidelines, irrespective of the infectious agent. Profession-specific barriers require profession-specific strategies to change attitudes, ensure organizational facilities, and provide an adequate setting for crisis management.

Key Words: Barriers; adherence; crises; outbreak management; infection control; guidelines.

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In outbreak situations that endanger the health care system, outbreak control measures must be initiated promptly to prevent further transmission of the pathogen. In such situations, authoritative guidance is needed. Countries all over the world have established their own structures to disseminate outbreak control

guidelines and, if necessary, put outbreak control systems in place. In a crisis, health care professionals with diverse backgrounds need to work quickly together to identify cases, perform laboratory diagnostics, trace contacts, and institute infection prevention and control measures as described in the outbreak control guidelines.¹ Optimal compliance with the guidelines, with timely and adequate outbreak control as final outcome, requires good adherence by professionals. Unfortunately, however, their adherence is often not optimal,²⁻⁵ due to knowledge, attitudes, and behavior among professionals,^{6,7} as well as to organizational and other factors. Guidelines are not always clear, and existing facilities are not always adequate or adaptable to the sudden intrusion of crisis measures. A systematic review conducted by Cabana et al⁸ revealed a variety of barriers that hinder adherence. The authors provide a generic framework for exploring barriers in various settings. According to the authors, barriers to adherence include those related to the professionals, with a more cognitive (knowledge, awareness) or affective (attitude, motivation) component,

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Conflict of interest: None to report.

0196-6553/\$36.00

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doi:10.1016/j.ajic.2010.03.006

those related to the guidelines (their content and target patient population), and those related to the environment (organization, social setting).⁸ Many studies have looked at determinants of adherence to guidelines in the routine care of infectious disease,⁹⁻¹⁴ but little is known about determinants of adherence to guidelines in crisis situations.^{15,16}

Crisis situations differ significantly from routine communicable disease control, because health professionals must respond with prompt decisions, uniformity of action, and quick integration of new knowledge and skills. Furthermore, the context of crisis situations is complex, requiring optimal communication and cooperation between public health services and hospitals. A better understanding of the reasons for nonadherence of health care professionals in crisis situations is needed to improve crisis management. Identification of generic and profession-specific barriers can lead to customized strategies designed to make guidelines work.

In this study, we assessed reasons for nonadherence (barriers) among key professionals in outbreak control in crisis situations: consultant microbiologists, infection preventionists, public health physicians, and public health nurses. We identified the generic and profession-specific priorities that need to be addressed to improve adherence to outbreak control guidelines.

METHODS

This cross-sectional study used questionnaires tailored to 4 groups: consultant microbiologists (M), infection preventionists (IP), public health physicians (PHP), and public health nurses (PHN). Each group's questionnaire was designed based on in-depth interviews with professionals in that group.

Questionnaire development

In-depth interviews lasting 1-1.5 hours were performed with 26 health care professionals (14 men and 12 women: M, $n = 7$; IP, $n = 7$; PHP, $n = 6$; PHN, $n = 6$). All had been actively involved in one or more of 4 recent crisis situations due to infectious outbreaks in The Netherlands: severe acute respiratory syndrome (SARS), *Clostridium difficile* ribotype 027, rubella, and avian influenza A/H7N7.¹⁷⁻²⁰ The participants' working experience averaged 15 ± 4 years for Ms, 14 ± 8 for IPs, 15 ± 5 for PHPs, and 10 ± 3 for PHNs.

For each of the 4 crises, an overview of control measures issued by the national outbreak management team (OMT) was provided before our interviews to facilitate recall by the professionals. The professionals were then asked to identify barriers they had experienced during the outbreaks as to case finding, infection prevention and control, laboratory testing, and contact

tracing. Sampling and interviewing continued until saturation was reached, that is, no new items were identified.

Conducted from January through March 2007 by 3 investigators (A.T., D.V., and F.W.), the interviews were audiotaped and transcribed verbatim. During the study, data collection was validated at intervals by discussion among the interviewers. The content of the tapes was analyzed by 2 investigators independently (A.T. and M.H.) to construct an overview. The investigators extracted the barriers and categorized them under 3 main headings, according to the validated framework to standardize obstacle reporting of Cabana et al⁸: "knowledge/attitude," "guidelines," and "organization/social setting." Interviews elicited a different number of barriers for each profession: 37 items for Ms, 25 items for IPs, 30 items for PHPs, and 38 items for PHNs. Details are available on request.

Cross-sectional study

Using the barrier overviews, questionnaires were designed for each profession. These instruments requested a response to each listed barrier, using a 5-point asymmetric Likert scale (strongly agree, agree, rather agree than disagree, disagree, strongly disagree). The questionnaires were administered to the PHPs and PHNs at public health services (September-November 2007), IPs at hospitals (January-March 2008), and M in various settings (February-April 2008). To cover the entire country, we requested that questionnaires be returned by at least one PNP and PHN from each of 33 public health services and by at least one IP from each of 94 hospitals. Because most microbiologists work in practices serving more than one hospital and/or public health service, we selected a nationwide sample of 30 practices to complete the questionnaire.

Analysis

Data from questionnaires were analyzed using SPSS version 15 for Windows (SPSS Inc, Chicago, IL). For each barrier and for each profession, descriptive statistics were obtained. For the analysis of questionnaires, the answers given in the 5-point scale were dichotomized to enable division between "yes" (barrier experienced) = strongly agree/agree/rather agree than disagree with the proposed barrier and "no" (barrier not experienced) = disagree/strongly disagree. We considered a barrier to be "often experienced" when at least 33% of the participants had experienced it. These barriers were included in the final overviews.

Generic or common barriers were those recognized by at least 3 categories of professionals. These barriers were included in univariate and multivariate

Table 1. Characteristics of the study participants

	M (n = 30), n (%)	IP (n = 100), n (%)	PHP (n = 45), n (%)	PHN (n = 37), n (%)
Sex				
M	22 (73)	30 (30)	30 (67)	6 (16)
F	7 (23)	67 (67)	15 (33)	31 (84)
Missing	1 (3)	3 (3)	-	-
Working experience, years				
<5	1 (3)	18 (18)	6 (13)	13 (35)
5-10	7 (24)	82 (82)	15 (33)	14 (38)
>10	22 (73)	0 (0)	24 (54)	10 (27)
Number of crises experienced				
< 5	14 (47)	96 (96)	11 (24)	21 (57)
5-10	11 (36)	4 (4)	16 (36)	7 (19)
>10	5 (17)	0 (0)	18 (40)	9 (24)
Number working, days/week				
2	0 (0)	2 (2)	0 (0)	2 (5)
3	0 (0)	21 (21)	5 (11)	11 (30)
4	4 (13)	23 (23)	13 (29)	18 (49)
5	26 (87)	47 (47)	27 (60)	6 (16)
Missing	-	7 (7)	-	-

M, microbiologists; IP, infection preventionists; PHP, public health physicians; PHN, public health nurses.

logistic models to assess the differences among the groups and the impact on barriers of selected variables, including profession, sex, years of working experience in communicable disease control, number of working days/week, and number of crises experienced. We predicted the probability of whether or not the barrier was experienced in practice in the logistic regression model. Statistical significance was defined by $P < .05$.

RESULTS

The questionnaires were returned by 45 PHPs, representing 32 public health services (96%); 37 PHNs, representing 27 public health services (82%); 100 IPs, representing 70 hospitals (74%); and all 30 Ms that we approached (100%). Table 1 summarizes the characteristics of the participants.

Generic barriers

Seven barriers that hamper adherence to outbreak control guidelines were identified by at least 3 categories of professionals (Table 2) and were analyzed in univariate and multivariate logistic models. Significant differences were found between the professions regarding the answers given in the cross-sectional study with respect to three barriers. Four of the 7 barriers were rated as equally often experienced. In the view of the respondents, adherence to outbreak control guidelines is low when the following factors apply:

1. There are no concrete targets for performance to measure the effectiveness of the measures.

2. Control measures are worded with insufficient urgency or definition.
3. Crucial instructions within control measures (concerning isolation, diagnostics, and treatment) are not clear or easily identifiable for each profession.
4. Measures regarding the use of personal protective equipment (PPE) are inadequate and not timely.

Profession, sex, age, number of working days/week, and the number of crises experienced did not influence professionals' opinion regarding these barriers. In multivariate analysis, however, the number of years of working experience was significantly associated with 2 barriers (Table 2). Compared with professionals with more working experience, those with less experience gave more importance to easily identifiable crucial recommendations on isolation, diagnostics, and treatment (odds ratio [OR], 2.68; 95% confidence interval [CI], 1.17-6.34) and the need for timely and adequate information on PPE and other safety precautions (OR, 2.17; 95% CI, 1.12-4.37).

Microbiologist-specific barriers

Of the 37 barriers extracted from in-depth interviews and used in the questionnaire for microbiologists, 20 (54%) were experienced by at least 33% of the group. Microbiologists reported higher adherence to control measures when they are directly alerted by the national OMT (83%) and when they receive a personal copy of the control guidelines (86%). For these professionals, the scientific basis for the measures was important (60%). They also acknowledged the need for follow-up by the OMT and readjustment

Table 2. The rating of common barriers per group of professionals (% answers “strongly agree/agree/rather agree than disagree with the proposed barrier”) and the results of the multivariate analysis

Barrier	M, %	IP, %	PHP, %	PHN, %	P value*	Multivariate analysis of the common barriers, adjusted OR (95% CI)				
						Years of working experience	Sex	Number of working days/week	Experience with crises	
Attitude										
Control measures are inconvenient to apply in hospital or public health setting.	82.8	64.2	48.9	56.8	.026	0.7 (0.3-1.4)	0.9 (0.4-2.0)	0.8 (0.5-1.3)	1.0 (0.9-1.2)	
There are no concrete targets for performance of the control measures.	82.7	75.7	71.1	NA	.52	1.5 (0.7-3.4)	1.2 (0.5-3.0)	0.6 (0.4-1.2)	0.9 (0.7-3.4)	
Guideline										
Control measures are not sufficiently tailored to the patient population.	72.4	72.6	28.9	64.8	<.0001	1.0 (0.5-2.0)	2.0 (0.9-4.8)	0.9 (0.6-1.5)	0.9 (0.8-1.1)	
Control measures are worded with insufficient urgency or definition.	58.6	51.0	50.9	64.9	.42	1.4 (0.7-2.7)	1.3 (0.6-2.8)	0.9 (0.6-1.5)	0.9 (0.8-1.1)	
Crucial instructions within control measures concerning isolation, diagnostics, and treatment are not clear or easily identifiable for each profession.	82.7	77.8	77.7	NA	.84	2.7 (1.1-6.3)	0.9 (0.3-2.7)	1.7 (0.9-3.2)	0.9 (0.7-1.1)	
Control measures regarding the use of PPE are not timely and adequate.	53.5	67.8	77.8	64.8	.19	2.1 (1.1-4.3)	0.9 (0.4-2.1)	0.9 (0.6-1.5)	1.0 (0.8-1.2)	
Organization										
Responsibilities for diagnosis and infection control are not clarified.	6.7	76.9	57.8	86.5	<.0001	1.4 (0.7-3.1)	1.1 (0.4-2.8)	0.6 (0.3-1.0)	1.0 (0.8-1.3)	

NA, not applicable (barrier not identified by this group).
* χ^2 test.

of the guidelines based on new developments or newly generated evidence during the crisis (83%). According to these professionals, setting-related factors that improve adherence to control measures include the availability of adequate cohorting and isolation facilities (83%), familiarity of hospital clinicians with the outbreak control and diagnostic guidelines (73%), and a leading role for microbiologists in the dissemination of guidelines to clinicians and IPs (83%) (Table 3).

IP-specific barriers

Of the 25 barriers to adherence identified by IPs, 18 (72%) were experienced by at least 33% of the respondents. Like the microbiologists, the IPs predicted improvement if they were alerted directly by the OMT at the beginning of a crisis (70%) and received a personal copy of the guidelines (78%). As particular problems, they emphasized lack of OMT follow-up during

progression of a crisis (70%), lack of concrete targets for performance (76%), and perceived delay in OMT communication of risks to local hospitals (68%). The IPs requested easily identifiable crucial instructions on infection prevention and control that IPs need to follow (78%), timely guidance on appropriate PPE (64%), and clear responsibilities regarding diagnosis and infection prevention and control (73%) (Table 3).

PHP-specific barriers

Of the 30 barriers identified by PHPs, 17 (56%) were experienced by at least 33% of the respondents. The PHPs cited no barriers related to knowledge, but 70% cited an awareness item (concrete targets for performance of outbreak control measures) as relevant to adherence. Mostly they emphasized external factors. To overcome these barriers, they urged easily identifiable, profession-specific instructions on diagnosis, infection control, and therapy (78%); timely guidance

Table 3. Overview of the commonly experienced profession-specific barriers* in the cross-sectional survey

Barriers	M, % yes [†]	IP, % yes	PHP, % yes	PHN, % yes
Knowledge				
The professional is not directly alerted by the outbreak management team during the crisis.	83	70	-	-
The professional does not receive a personal copy of the outbreak control guidance issued by the outbreak management team.	87	79	-	-
The professional does not have the lead in the dissemination of the guidance to clinicians and IP.	83	-	-	-
There is no centralized information system dedicated to hospital staff regarding the outbreak control guidance.	-	84	-	-
Attitudes				
Control measures are inconvenient or difficult to apply in the hospital or public health setting.	80	83	49	57
There is no formal status of the outbreak control guidance within the group of professionals.	-	70	-	-
There is no follow up of the progress by the outbreak management team that issues the guidance.	83	70	-	-
There are no concrete targets for performance of the control measures.	83	76	71	-
There are no external audits to assess results, following the acute phase of a health care crisis.	83	-	-	-
The diagnostic guidelines interfere with and disturb the daily routine in the laboratory.	73	-	-	-
Additional testing and data collection for research purposes (generating new knowledge) during outbreaks interferes with and disturbs commitment to perform patient care.	80	-	-	76
Sending each sample to the (national) reference laboratory for typing by molecular techniques is time-consuming.	70	-	-	-
The professional perceives a delay in communicating risks due to transmission of pathogens in hospitals during international crises.	-	68	-	-
The professional does not agree with the level of PPE advised in the outbreak control guidance.	-	40	-	-
It is difficult to ensure sustainability of the control measures once the acute phase of the outbreak has passed.	-	-	-	81
Guidelines				
Control measures are not evidence-based.	60	-	-	-
Control measures are not sufficiently tailored to the patient population.	72	73	-	65
Control measures are worded with insufficient urgency or definition.	59	51	51	65
Control measures advised by the national outbreak control team deviate from the WHO guidance.	-	41	-	-
Crucial instructions within control measures concerning isolation, diagnostics, and treatment are not clearly formulated, and not easily identifiable for each profession.	83	78	78	-
Case definitions and screening algorithms are not applicable to crisis/outbreak patients in the hospital situation.	77	60	-	-
Control measures regarding the use of PPE and safety precautions are not timely or adequate.	53	68	78	65
There are no clear instructions on samples collection for laboratory diagnostics (eg, type of samples, materials needed).	-	-	87	-
When guidance is issued, the increased costs related to outbreak control measures are not considered.	-	-	73	-
Organization				
There is a restricted budget for laboratory diagnostics due to cost considerations in hospital care.	43	-	-	-
There are no sufficient cohorting and isolation facilities to prevent further transmission.	83	80	-	-
There is no familiarity and awareness of other clinicians with the outbreak control and diagnostic guidelines.	73	-	-	-
Responsibilities for diagnosis and infection control are not clarified.	-	77	58	86
Routine clinical commitments do not allow extra time for implementation of outbreak control guidance.	70	-	-	-
Providing explanation of control measures, safety precautions and reducing anxiety among public and nurses (including information in foreign languages) is time-consuming.	-	78	-	73
There are no proper IT tools to generate real time data during crises (eg, vaccination coverage).	-	-	71	-
There is no centralized purchase and distribution system for PPE.	-	-	69	70
There are time constraints to up-date local protocols on outbreak control, during crises.	-	-	-	81
Setting				
Round-the-clock availability of front line physicians is not guaranteed.	-	-	71	-
The public health service has no means to monitor compliance of front line physicians with the measures.	-	-	80	78

Continued

Table 3. (Continued)

Barriers	M, % yes [†]	IP, % yes	PHP, % yes	PHN, % yes
There is no reimbursement system for outbreak control tasks undertaken by front line physicians.	-	-	75	-
There are problems in the communication between various groups of professionals.	-	-	71	-
There is no clear chain of command and control at regional level.	-	-	69	-
There is no clear division of responsibilities between the community emergency departments and public health services in crises.	-	-	73	76
There is no endorsement of outbreak control measures by local policy makers.	-	-	69	-

*Barrier experienced by at least 33% of the group.

[†]Yes, strongly agree/agree/rather agree than disagree with the proposed barrier.

on the type of PPE and instructions on its use (78%); better instructions on sample collection (86%); and increased OMT awareness of the cost implications of the advised measures (73%). Organization-related factors included the lack of proper information technology systems for real-time surveillance of new cases during a crisis (71%) and the lack of a centralized system for purchasing and distributing PPE (70%). Barriers related to the social setting included the uncertain availability of round-the-clock front-line physicians during crisis situations (71%), uncertain division of responsibilities between community emergency departments and public health services (73%), and the need for endorsement of the control measures by local policy makers (70%) (Table 3).

PHN-specific barriers

Of the 38 barriers identified, 12 (31%) were experienced by at least 33% of the PHNs. For nurses, adherence to crisis guidelines is related mostly to practical aspects, such as adequate time to perform control measures (73%) and update local protocols on the basis of newly issued guidance for crisis (81%). The PHNs also favored clear responsibilities for sampling patients, providing PPE, and performing infection prevention and control measures (86%); clear mandates for the public health service to monitor compliance of the front-line physicians (78%); and a clear division of responsibilities between community emergency departments and public health services (76%) (Table 3).

DISCUSSION

Four generic barriers were identified and rated as equally important in the cross-sectional study, reflecting requirements for improving adherence to crisis guidelines that cross professional lines. What can we do to make guidelines in crises work? First, to emphasize the degree of urgency, the guidelines should be worded imperatively by the issuing committee. Furthermore, they should include crucial instructions

that are easily identifiable for the various professional groups, and should be accompanied by concrete targets for performance. Finally, timely instructions should be provided on the use of PPE, along with precautions to optimize personal safety and minimize the risk of occupational exposure during patient care and contact tracing.

When professionals with different backgrounds suddenly need to work together and depend on each other, as happens in complex crises, unclear or tentative language can sap the strength of guidelines. According to our participants, crucial guidelines should use explicit and even imperative language, reflected by the words “must” and “should,” for example. Guidelines that instead ask professionals to “consider” taking a certain action do not sound crucial and are less likely to inspire adherence.

Which instructions are crucial? Outbreak control guidance consists of comprehensive instructions on case finding, contact tracing, diagnostics, surveillance, treatment, infection prevention, and health promotion. Under time pressure, those concerning infection prevention (eg, isolation, PPE), diagnostics, and treatment are the ones that matter most to the involved professionals, because they are essential to stop further transmission and improve patient outcomes. Especially in these areas, instructions must be not only definitive and imperative, but also easily identifiable by various professionals as to their own particular responsibility areas. Interestingly, Lo et al³ found that adherence to crucial recommendations in hospital settings during routine infectious diseases consultations was significantly higher than adherence to noncrucial recommendations, which is consistent with our findings.

Besides clarity of wording and crucial recommendations for each group of professionals, crisis guidelines should contain concrete targets for performance to guide successful implementation. For instance, when advising contact tracing and chemoprophylaxis, additional criteria should be provided, such as the percentage of persons who should be approached and the optimal time frame in which to do so. These criteria

are considered important for the professionals who have to implement the measures, because they reduce uncertainty about what is expected, and they also could be helpful to external assessors who evaluate crisis control. Our participants agreed that such targets will increase the internal motivation to adopt the measures and also enable readjustment of expectations when necessary.

Finally, there is the issue of professional safety. More than in other fields of health care, dealing with outbreaks raises major concerns with respect to personal safety and prevention of nosocomial spread. In crises, especially when facing a new pathogen, health care professionals expect immediate information on which infection control procedures to put in place. Timely, solid guidance for health care professionals on ways to minimize their own risk by wearing PPE and complying with safety instructions will increase not only their protection, but also their confidence and motivation.^{21,22} Apart from motivation, beliefs, and attitudes, adherence to individual protective measures also depends on organizational factors.^{16,23,24} According to Gershon et al,²⁴ a safety climate characterized by a strong organizational commitment to safety leads to increased compliance with the use of PPE. As in our study, approval of the guidelines by coworkers and endorsement by the management were reported to facilitate adherence.

These 4 priorities are, in our opinion, the starting point for improving adherence to outbreak control guidelines in crises. They are generic, in that they affect all 4 professions that we studied. However, we also found that different groups of professionals have different expectations and experience different problems with respect to the crisis guidelines. These depend on the context in which they work and the degree to which control measures interfere with daily routines, increase workloads, and require new skills and equipment. Our study confirms earlier results reported by Grol et al²⁵ indicating that general practitioners's adherence decreases when guidelines demand changes to existing routines and when they lack pertinent advice on actions and decisions. Outbreak committees that issue the guidelines must be aware of these factors so they can tailor instructions to the specific needs and problems of the diverse professional groups involved.

From the perspective of professionals working in hospitals (ie, microbiologists and IPs), improving adherence should aim at increasing crisis awareness in that setting through, for example, better alerting systems and more transparency in the dissemination of crisis measures. These professionals emphasized the need to directly involve hospital professionals. They also urged increased availability of organizational facilities for outbreak control, such as the capacity for

cohorting and isolating patients. Our results are consistent with findings of recent studies of preparedness in hospital emergency departments. In a survey conducted by Rebmann et al,²⁶ 15% of IPs reported that their hospital had insufficient isolation facilities (eg, negative-pressure rooms) for routine needs. Even when facilities were sufficient, only 47% of the hospitals were equipped to accommodate an isolation surge.

The PHPs and PHNs reported barriers related mostly to the organizational and social setting. For them, commitment and round-the-clock availability of local front-line physicians are crucial. Moreover, the PHPs and PHNs need ways to monitor and encourage the compliance of these physicians with the crisis measures. Another commonly reported barrier was the need to define responsibilities between public health professionals and hospital professionals with respect to sampling patients and performing infection prevention and control measures. In the social context, implementing crisis guidelines and improving outcomes of measures require a clear chain of command, with control and endorsement by local policy makers.

This study has several limitations. We first explored barriers to adherence through in-depth interviews, then assessed the frequency of these barriers in the cross-sectional study to generate priorities for future strategies. In contrast, Barlow et al⁹ began with the cross-sectional part and followed with in-depth interviews. However, they studied adherence to guidelines in routine care situations and had access to previous publications when constructing their framework of barriers. Given that no systematic research has been published on barriers in times of crisis, we needed in-depth interviews to explore these barriers and build the baseline framework. This qualitative approach enabled optimal exploration of hidden reasons for nonadherence. We were able to describe patterns of barriers that influence adherence, together with more individual specific constraints. Because the reported barriers might be different from those observed during outbreaks, they should be regarded as a proxy for reality. Nevertheless, they provide a basis for formulating priorities to improve adherence to guidelines in crises. We believe that our results are applicable to other industrialized countries with similar health care organization and professions as The Netherlands.

Making crisis guidelines truly effective requires a multidisciplinary approach and optimal professional knowledge and attitudes, along with organizations capable of crisis management in social settings that facilitate adequate preparation and quick response. This is the first study to systematically assess the barriers that can obstruct adherence to crisis guidelines from the standpoint of the individual health care professional. To improve adherence of these professionals

in outbreak crises, priority should be given to the 4 generic barriers that we have described, irrespective of the infectious agent involved. Furthermore, for each group, profession-specific barriers need to be addressed through specific implementation strategies regarding improvement of knowledge, changing of attitudes, ensuring organizational facilities (eg, sufficient capacity for single room isolation, surge cohorting capacity, and surge laboratory capacity), and providing an adequate setting for performing crisis management.

We thank D. Vos, O. Jacobs, and F. Weidema for their help with data collection and J. van Doremalen for his support with the data analysis. We also thank L. Phillips for editing the manuscript. We are grateful to the professionals who anonymously agreed to participate in the in depth-interviews and to all of the respondents to the barriers questionnaires. This research was supported by a grant from the Dutch Organization for Health Research and Development (ZonMw).

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