The Quality of Travel Clinics in the Netherlands

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DOI: 10.1111/j.1708-8305.2006.00071.x

Background. In 1996, the Dutch National Coordination Center for Travelers’ Health Advice (LCR) was established to improve uniformity in health advice to travelers and in the quality of national vaccination centers. In this study, we evaluate the influence of LCR guidelines on the quality of travel clinics in the Netherlands.

Methods. In 1997 and 2001, questionnaires regarding implementation of LCR quality criteria were sent to the Dutch travel clinics where most travel advice is given. In 2003, the Health Care Inspectorate surveyed all Dutch yellow fever vaccination centers including those surveyed in 1997 and 2001. The data yielded by all three surveys were included in our assessment.

Results. The response rate was 78, 84, and 100% in 1997, 2001, and 2003, respectively. Between 1997 and 2001, the number of travel clinics with 5,000 visitors or more increased. The LCR quality criteria are widely implemented: of the criteria surveyed in this study, 11/14 (79%) were implemented in more than 80% of the clinics in 2003. Between 1997 and 2003, vaccine management improved (e.g., registration of batch numbers and monitoring of refrigerators); in more clinics, physicians were present in case of emergency and advice given by nurses was more often checked daily, but this is still only in 52% of the travel clinics. Although two thirds of the professionals working in travel medicine are nurses, only 55% of them were adequately trained in this specialty.

Conclusions. Between 1997 and 2003, the LCR quality guidelines are widely implemented, but implementation can still be improved. To further improve the quality of travel clinic staff, the LCR recently started certification of basic and refresher courses for physicians and nurses working in travel medicine and now registers those completing such courses.

In 1996, the Netherlands was one of the first countries in the world that established a National Coordination Center for Travelers’ Health Advice [Landelijk Coördinatiecentrum Reizigersadvisering (LCR)]. In the Netherlands, the vast majority of travelers’ health advice is provided by travel clinics run by Municipal Health Services (MHS) and by a few hospitals with tropical medicine departments. Occupational health services and general practitioners provide their employees and their own patients with travelers advice. More recently, the number of private travel clinics is growing. The aims for the LCR are twofold: first, to obtain uniformity in travelers’ health advice in the Netherlands and second, to improve the quality of travel clinics. To achieve the first goal, LCR published national guidelines for vaccinations and malaria prophylaxis for travel clinics in 1996. To achieve the second goal, it published quality criteria for travel clinics in 1997 and adapted them for general practitioners specialized in travelers’ advice in 1999.¹

The criteria describe the national laws, professional training, administration responsibilities and delegation of authority, and requirements for cold-chain preservation, registration of batch numbers, and quality control mechanisms. The LCR guidelines and amendments are available through LCR membership, which is optional but required to obtain a yellow fever license.
Specialists in various working groups develop all LCR protocols and guidelines. Before publication, they must be approved by a national LCR consensus group, in which professionals working in all different settings of travel medicine in the Netherlands are represented. The consensus group includes the Health Care Inspectorate (Inspectie voor de Gezondheidszorg (IGZ)), which acknowledges the LCR guidelines and quality criteria and uses them in its travel clinic quality inspections.

In 2002, to improve the quality of professionals working in travel medicine, the LCR published criteria for basic and refresher courses for nurses and physicians working in travel medicine. Since 2004, courses that meet these criteria are certified by LCR and published on its Web site (www.lcr.nl).

The Stichting Harmonisatie Kwaliteitsbeoordeling in de Zorgsector (HKZ) is an organization that develops certification curricula by which health care organizations can achieve a quality certificate. In 2002, the HZK published a certification program related to prevention and treatment of infectious diseases in public health, including chapter VI: guidelines for assessing travelers’ advice and immunization clinics. These guidelines are based on, and in agreement with, the LCR quality criteria.

Finally, general practitioners in the Netherlands, who are nationally united in the Nederlands Huisartsen Genootschap (NHG) are now developing a certification system for travelers’ advice based on LCR criteria.

According to Dutch law, yellow fever vaccinations may only be given in licensed yellow fever vaccination centers. Licenses are issued by the Minister of Health, Welfare and Sport, based on IGZ advice. Prescribing medication (ie, malaria prophylaxis and vaccinations) is by law restricted to physicians. In general, prescribing medication cannot be delegated to nurses. However, in travel medicine, an exception has been made as follows: nurses following the protocols (created by physicians) can prescribe and administer vaccinations to healthy persons without direct intervention of a physician. Another nurse or doctor must check each prescription the same day so that any mistake can be swiftly corrected.

Furthermore, in travel medicine, nurses may give preprinted and presigned prescriptions for malaria prophylaxis to healthy persons without immediately consulting a physician. These prescriptions must be checked the same day by a physician and corrected, if necessary. Nurses are not allowed to prescribe for travelers with preexisting medical conditions, nor to give prescriptions other than those described in the LCR protocols without first consulting a specialized traveler’s health physician. Therefore, a specialized physician must always be available in person or on call.

For medical emergencies, a physician—not necessarily specialized in traveler’s medicine—must always be present on-site during vaccination hours.

To assess the quality of the vaccination centers in the Netherlands, questionnaire-based surveys were conducted in all MHS and hospitals with travel clinics in 1997 and 2001 and in yellow fever vaccination centers in 2003. Here, we present the results of these studies.

Methods

To evaluate whether the LCR guidelines and quality criteria published in 1996 and 1997 were followed and implemented, questionnaires were sent to all MHS and hospital travel clinics in the Netherlands in 1997. To evaluate changes in quality, the survey was repeated in 2001. Questions asked were, for example, “What supervising system is in place during training of new travel advisors?” “Can clients get a consultation by phone?” “Which information resources are available in the travel clinic?” “Do clients have to sign personal health declarations?” “Can nurses consult a physician in situations that surpass their qualifications?” “Is there a protocol for treatment of anaphylactic shock?” “Is the temperature of the refrigerators checked daily?” In 2003, the Health Care Inspectorate surveyed the quality of all Dutch vaccination centers within the travel clinics licensed to vaccinate for yellow fever. Similar questions were asked as in the previous studies, and the data yielded by all three surveys were included in our assessment.

Chi-square was used to test for changes in outcome between different years.

Results

In 1997, questionnaires were sent to 56 MHS travel clinics and to 3 travel clinics in hospitals; they were returned by 43 MHS and all 3 hospital travel clinics, for an overall response rate of 78% (46 of 59). In 2001, 38 of 46 MHS travel clinics as well as all 3 hospital travel clinics returned the questionnaires, for an overall response rate of 84% (41 of 49). The IGZ survey in 2003 was sent to all yellow fever vaccination centers, including all 39 MHS clinics and the 3 aforementioned hospital travel clinics. All 42 centers returned the questionnaires because this was compulsory for the centers to retain their yellow fever license.
Figure 1 shows that clinics became larger between 1997 and 2003. In 1997, 12% of the travel clinics saw more than 5,000 clients per year. In 2001 and again in 2003, the number of travel clinics with more than 5,000 visitors had increased to 23 and 31%, respectively.

Table 1 shows the results of the three surveys. All criteria that were covered by both the LCR and the IGZ surveys are shown, as well as information about the level of training of the professionals obtained in 2003.

Between 1997 and 2003, clients were significantly better informed about vaccination prices before consultation (66, 98, and 100% in 1997, 2001, and 2003, respectively, \( p < 0.05 \)). Daily checking of LCR-guided advice by nurses took place in only 20% of the travel clinics in 1997; this improved significantly over the years but remained low (49% in 2001 and 52% in 2003, \( p < 0.05 \)). Registration of batch numbers for yellow fever vaccination took place in 100% of the vaccination centers in all three surveys, but registration of batch numbers for other vaccinations improved significantly from 57% in 1997 to 81% in 2003 (\( p < 0.05 \)).

Also, the proportion of travel clinics that require travelers to sign a health statement improved from 85% in 1997 to 98% in 2003, the presence of a physician in case of emergency became more common although not standard (80, 83, and 93% in 1997, 2001, and 2003, respectively), and daily checking of the temperature of refrigerators improved.

The opportunity for nurses to consult a travel medicine specialist declined significantly in 2003 (98, 100 and 86% in 1997, 2001, and 2003, respectively, \( p < 0.05 \)). A protocol for vasovagal collapse was significantly less often present in 2003 (100% in 1997 and 2001, and 93% in 2003, \( p < 0.05 \))

Because criteria for training programs specific to travel medicine were not published until 2002, adequate training of professionals could only be studied in the 2003 survey. Although two thirds of the professionals working in travel medicine in the Netherlands are nurses and one third are physicians, we found that 93% of the physicians working in travel medicine were adequately trained but only 55% of the nurses.

Discussion

Since establishment of the LCR, the guidelines are widely used and accepted by travel clinics run by MHS, hospitals with tropical medicine departments, occupational health services, general practitioners and private groups, and the quality has subsequently improved. Factors that contributed to this wide acceptance are the nationwide involvement of professionals in the creation of the guidelines through the LCR consensus group, the combined publication of vaccination and quality guidelines, implementation of the quality criteria in national certification curricula for public health clinics and general practitioners. The fact that LCR guidelines include the World Health Organization (WHO) International Health Regulations for yellow fever vaccination centers means that quality criteria can be used by the Inspectorate of Health in evaluation of quality of yellow fever vaccination centers. Conversely, to obtain a yellow fever license, travel clinics must subscribe to LCR guidelines.

The total of MHS clinics in the Netherlands has decreased from 56 in 1997 to 46 in 2001 and 39 in 2003. This is caused by fusion of several MHS clinics. These fusions are part of the reason for the growth of travel clinics in Figure 1.

Although the LCR quality criteria were implemented in most vaccination centers, further improvement is needed: most urgently where nurses cannot always consult a physician, where prescriptions are signed by nurses, and where advice given by nurses is only checked daily by another professional in 52% of the cases. Furthermore, nurses are not adequately trained: two thirds of the professionals working in travel clinics were nurses, of whom only 55% were trained adequately in 2003.

To improve education and training of both nurses and doctors, in 2004, the LCR started to certify physician training courses that meet the LCR quality criteria and promoting these courses on the Web site (www.lcr.nl). Since then the quality of education has improved: training courses that did not meet the quality criteria in 2003 were improved and have subsequently been certified. In 2005, the LCR created a register of “traveler’s physicians”
who meet the aforementioned LCR education criteria to be published on the Web site. Recertification of physicians will be required every 5 years. A similar certification and registration trajectory for nurses was started in 2005.

The organization of travel medicine differs widely among countries in the world.4–6 Travelers’ health advice is provided by tropical disease specialists, general practitioners, pharmacists, and nurses.4 Settings vary from hospitals to public health clinics to private offices. In some countries, travel clinics are state owned; in others, most of them are private clinics.6 As in the Netherlands, many countries try to achieve more uniformity and create national guidelines for immunizations and malaria prophylaxis. These guidelines are usually published on Web sites.7–11 Quality criteria for the general practice of travel medicine are less widespread and are usually published later than the national vaccination guidelines. In Canada, for example, “guidelines for the practice of travel medicine” were published by “Health Canada” in 1999.12 In the UK, quality criteria for yellow fever vaccination centers (“standards, training, and support”) were published in 2004, a year after the “National Travel Health Network and Centre” was launched.13

To improve the quality of health professionals, the International Society for Tropical Medicine published in 1999 their “body of knowledge for the practice of travelers medicine,” which professionals can use to achieve an international certificate of competence.14

Even more recent are efforts to ensure the quality of travelers’ health advice. Some countries have started the registration of professionals and travel clinics; most countries list their yellow fever vaccination centers.13,15 In 2001, the American Society of Tropical Medicine and Hygiene (ASTMH) began to offer a list of Approved Prerequisite Courses for the Diploma Course Pathway related to clinical tropical medicine and travelers’ health. Approved courses are listed on the ASTMH Web site.16 Since 2004, the ASTMH has offered a biannual examination for licensed health care professionals (ie, Medical doctors, registered nurses) leading to certification. In Germany,

### Table 1 Implementation of LCR quality criteria by Dutch vaccination centers in 1997, 2001, and 2003

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1997 (LCR), n (%)</th>
<th>2001 (LCR), n (%)</th>
<th>2003 (IGZ), n (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response rate</td>
<td>46/59 (78)</td>
<td>41/49 (84)</td>
<td>42/42 (100)</td>
<td></td>
</tr>
<tr>
<td>All clients are clearly informed about vaccine prices</td>
<td>66</td>
<td>98</td>
<td>98</td>
<td>0.000</td>
</tr>
<tr>
<td>All clients are required to sign a personal health declaration form at each visit</td>
<td>85</td>
<td>90</td>
<td>98</td>
<td>0.116</td>
</tr>
<tr>
<td>Advice given by nurses is daily checked by another travel medicine professional</td>
<td>20</td>
<td>49</td>
<td>52</td>
<td>0.000</td>
</tr>
<tr>
<td>All malaria prescription are signed by physician</td>
<td>na</td>
<td>63</td>
<td>71</td>
<td>0.436</td>
</tr>
<tr>
<td>A physician can always be present within 5 min in case of emergency</td>
<td>80</td>
<td>83</td>
<td>93</td>
<td>0.228</td>
</tr>
<tr>
<td>Nurses can always consult a physician specialized in travel medicine in situations that surpass their qualifications</td>
<td>100</td>
<td>98</td>
<td>86</td>
<td>0.008</td>
</tr>
<tr>
<td>Deviations from guidelines are registered in client files, together with the reason</td>
<td>83</td>
<td>83</td>
<td>86</td>
<td>0.333</td>
</tr>
<tr>
<td>Batch numbers of yellow fever vaccinations are registered</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Batch numbers of other vaccines are registered</td>
<td>57</td>
<td>76</td>
<td>81</td>
<td>0.029</td>
</tr>
<tr>
<td>The temperature of refrigerators are checked daily</td>
<td>65</td>
<td>66</td>
<td>90</td>
<td>0.116</td>
</tr>
<tr>
<td>A protocol for vasovagal collapse is available</td>
<td>100</td>
<td>100</td>
<td>93</td>
<td>0.031</td>
</tr>
<tr>
<td>A protocol for anaphylactic shock is available</td>
<td>100</td>
<td>100</td>
<td>98</td>
<td>0.320</td>
</tr>
<tr>
<td>The responsible physician attended an approved course in travel medicine</td>
<td>na</td>
<td>na</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>The nurses attended an approved course in travel medicine</td>
<td>na</td>
<td>na</td>
<td>55</td>
<td></td>
</tr>
</tbody>
</table>

LCR = survey by National coordination center for travelers health advice; IGZ = survey by Health Care Inspectorate; na = not asked.
yellow fever centers are listed on a Web site, and physicians who completed an authorized course are indicated on this same Web site. In the UK, since 2005, professionals who work in yellow fever vaccination centers must regularly attend an approved training seminar in order for the center to retain this designation.

In the Netherlands, to maintain and further improve the quality of travel clinics, all travel clinics and general practitioners will soon be recommended to apply for “HKZ” or “NHG” certification of their clinic. Because both certification programs are based on LCR criteria, certification will be granted only to clinics that meet the LCR quality criteria and employ LCR-registered staff. For recertification, regular audits will be required. The names of all certified centers will be published, so travelers can base their choice on quality as well as costs.

In this way all yellow fever vaccination centers and all other travelers’ vaccination centers will be motivated to take responsibility for their quality. By publishing certified vaccination centers on a Web site, vaccination centers that do not meet the quality criteria will become visible to clients and to IGZ and, if necessary, will lose their yellow fever license.

Conclusions
This is the first study that examines the implementation of national guidelines for travel clinics and subsequent improvement in their quality after a national coordination center for travelers’ health was established. Although the quality of vaccination centers in the Netherlands has improved since 1997, not all centers meet the LCR quality criteria yet. Introduction of a certification system for travel health professionals and for vaccination centers with and without a yellow fever license will further improve and secure the quality of travel medicine in the Netherlands.

Declaration of Interests
The authors state that they have no conflicts of interest.

References
2. Stichting Harmonisatie Kwaliteitsbeoordeling in de Zorgsector. Organisaties/afdelingen voor Infec-