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# **The National Immunisation Programme in the Dutch Caribbean**

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to:

the Minister of Health, Welfare and Sport

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No. 2012/13, The Hague, August 16, 2012

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To the Minister of Health, Welfare and Sports

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Dear Minister,

In this advisory report a committee of the Health Council assesses the content of the National Immunisation Programme against the background of the specific epidemiological situation in the Dutch Caribbean and the region. So far, the vaccinations against pneumococcal disease, meningococcal C disease and cervical cancer are not part of vaccination programmes in the Dutch Caribbean. It is likely that by including these vaccinations considerable health gains could be achieved, as was the case in the European part of the Netherlands.

An inevitable limitation of the assessment is the scarcity of scientific data on the occurrence of vaccine preventable diseases on the islands. The population simply is too small for epidemiological research of sufficient size, and even research in a larger area will not provide the answer. From a precautionary standpoint the Committee therefore only recommends potential additions to the current programmes, it does not assess whether certain vaccinations that are administered in the European part of the Netherlands could be left out. Apart from that, there are currently no indications that such a measure could be justified.



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**Gezondheidsraad**

Health Council of the Netherlands



Subject : presentation of advisory report *The National  
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Future changes should aim at alignment of the schedules in the Dutch Caribbean with that in the European part of the Netherlands, but for practical reasons slight variations should remain possible.

Yours sincerely,

(signed)

Prof. dr. H. Obertop,

Acting President

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# Executive summary

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## **New status for Bonaire, St Eustatius and Saba**

In 2010, the islands Bonaire, St Eustatius and Saba, together referred to as the Dutch Caribbean, became so-called public bodies, functioning as special municipalities of the Netherlands. As a consequence, the Minister of Health, Welfare and Sports is now responsible for public health in both the European Netherlands and the Dutch Caribbean.

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## **Applicability of the National Immunisation Programme**

Since people in the Netherlands are offered protection against a number of infectious diseases by means of the National Immunisation Programme (NIP), the new situation brings up the question whether this programme can be similarly applied in the Caribbean part of the Netherlands. The Minister asked the Health Council to advise her on this matter, taking into account the geographical situation and possible differences in the epidemiology of vaccine preventable infectious diseases.

To consistently and accountably assess whether any vaccinations need to be included in the NIP, the permanent Health Council Committee on the NIP has formulated seven criteria. The criteria are based on two ethical principles: 1) optimal protection of the population as a whole and 2) justified repartition

between different groups in society, protecting those who need protection most urgently.

Given the new situation, this means that equal protection needs to be established in the European and Caribbean parts of the Netherlands, though not necessarily with completely identical immunisation programmes, since epidemiological differences could justify certain variations.

Problematic in this respect is the lack of reliable data on the occurrence of vaccine preventable diseases in the Dutch Caribbean. The population is too small for sound epidemiological studies to be carried out, and even studies from a wider region do not offer sufficient insight.

As a result, there can be no scientific grounds for the conclusion that certain vaccinations in the current NIP may serve no function in protecting the inhabitants of the Dutch Caribbean. The Committee will therefore not advise to leave any out. It will only evaluate whether any vaccinations may need to be added.

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### **Adding vaccinations from the NIP**

Three vaccinations that are part of the NIP are currently not available in the Dutch Caribbean. To adequately protect the population on the islands, the Committee advises to extend the programme in the Dutch Caribbean with:

- Vaccination against pneumococcal disease
- Vaccination against meningococcal C disease
- Vaccination against cervical cancer.

Furthermore, the oral polio vaccine currently used on Bonaire needs to be changed to an intramuscular, inactivated vaccine. Complete alignment in the timing of repeat and booster vaccinations could be advisable, but local and practical considerations can warrant some variations to be upheld.

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### **Adding vaccinations from other existing programmes**

The Committee has also evaluated whether existing vaccination programmes that are not part of the NIP need to be added in the Dutch Caribbean. It has concluded that one addition is required:

- Targeted vaccination against tuberculosis.

If the applicability of the Nationale Programme of Influenza Prevention to the Dutch Caribbean is to be judged, the Committee recommends a separate

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assessment. Vaccination against rotavirus infection is currently under evaluation for the NIP, and the applicability for the Dutch Caribbean will be assessed within the context of this evaluation.

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### **The importance of adequate facilities**

For the proper execution of an immunisation programme, appropriate laboratory facilities are a prerequisite. Access to good laboratory facilities should be guaranteed on Bonaire, St Eustatius and Saba themselves, on other islands in the region, or in collaboration with other institutions outside the region, as the existing facilities are insufficient. Close monitoring of adverse events after vaccination is important. A surveillance system should therefore be set up.

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### **The importance of flexibility**

Circulation of different strains or serotypes of pathogens in the region and practical reasons may call for the procurement of vaccines from other providers than the ones in Europe. Therefore, the Committee advises to leave a degree of freedom to the implementation of the NIP in the Dutch Caribbean, provided that the residents are protected sufficiently.

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# Introduction

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## 1.1 Cause for the advice

The Dutch islands Bonaire, St Eustatius and Saba have recently gained the status of public bodies, functioning as special municipalities of the Netherlands. Before the 10<sup>th</sup> of October 2010 the three islands belonged to the Dutch Antilles, until that date a country within the Kingdom of the Netherlands. The other isles of the former Dutch Antilles, Curacao and St Maarten have followed the earlier example of Aruba to become separate countries within the Kingdom. Collectively Bonaire, St Eustatius and Saba are referred to as the Dutch Caribbean.

This change in status of Bonaire, St Eustatius and Saba has many implications. In the years to come, more and more Dutch laws will become applicable on the islands. Where public health is concerned, the three special municipalities have come to fall under the responsibility of the Dutch Minister of Health, and its inhabitants have the right to be protected by the National Immunisation Programme (NIP).

Bonaire, St Eustatius and Saba are located in the Caribbean Sea. Together they have about 18,000 inhabitants, living on a total of 328 square kilometres. For comparison: on the Dutch Waddeneilanden 24,000 people live on 425 km<sup>2</sup>.

Given this change, the Minister of Health has asked the Health Council for advice concerning immunisation in the Dutch Caribbean. She wants the council to assess the applicability of the National Immunisation Programme to the Dutch Caribbean, taking into account the possible differences in the epidemiology of vaccine preventable infectious diseases due to the geographical situation of the islands.

She explicitly asks to call in the expert opinion of local health workers and to involve experts of CAREC (Caribbean Epidemiology Centre) and PAHO (Pan American Health Organization). CAREC is a public health information, service and consulting organization, administered on behalf of 21 Member Countries by the Pan American Health Organization (PAHO), which in turn is the World Health Organization's Regional Office for the Americas.

Since implementation is a matter for the National Institute for Public Health and the Environment (RIVM), practical and logistical matters need not be discussed. The request for advice can be found in Annex A.

The Minister's request has been taken up by one of the permanent Committees of the Health Council. The members of this Health Council Committee on the National Immunisation Programme are listed in Annex B. In drawing up this advisory report, the Committee has profited from calling in regional expertise. Recommendations of PAHO/CAREC have also been taken to heart. A list of contributors to this advisory report is to be found in Annex B.

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## **1.2 Proceedings of the Committee**

The guiding principle in deciding on the applicability of the current National Immunisation Programme in the Dutch Caribbean is the right for all citizens, regardless of their geographical location, to be protected by the NIP. At the same time, consideration needs to be given to possible differences in epidemiology due to historical and geographical factors.

However, epidemiological data specifically relating to this region is scarce. The numbers of inhabitants are simply too small to produce epidemiologically sound estimates of disease occurrence. This problem persists even if research encompasses a larger area in the Caribbean.

As a result, a strong basis for leaving out vaccinations in the Dutch Caribbean is not available, even if scarce epidemiological information would suggest a very low occurrence or even absence of a disease. This means that the Committee will not look into the elimination of any vaccinations currently present in the National Immunisation Programme.

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An additional consideration in this respect is that citizens in the Dutch Caribbean frequently travel to Europe and the Americas. Their immunological status should therefore protect them in those environments. It should also prevent the introduction of new diseases to the islands upon returning home. This is particularly important since the impact of an outbreak could be disproportionately large in such small populations.

Given the absence of specific epidemiological data and the importance of adequate protection against disease, the evaluation of the applicability of the NIP in the Dutch Caribbean will consist of two steps.

First, the Committee needs to establish if any vaccinations that are part of the scheme in the European Netherlands but not in the Dutch Caribbean need to be added in the latter region. Second, the Committee needs to evaluate whether the Dutch Caribbean may require specific vaccinations that are not part of the present National Immunisation Programme, but for which other programmes are currently available in the European Netherlands.

Given these requirements and considerations, the Committee will answer the following questions:

- 1 What criteria should be used for deciding on a possible differentiation in vaccination schemes on specific points?
- 2 How do vaccination programmes in the European Netherlands compare to existing programmes in the Dutch Caribbean?
- 3 What can be learned from the vaccination policy in the overseas regions of France?
- 4 Are there reasons to expand the vaccination scheme in the Dutch Caribbean to bring it in alignment with the current Dutch Immunisation Programme?
- 5 Are there reasons to introduce vaccinations in the Dutch Caribbean that are not part of the regular NIP?
- 6 What recommendations can be made for the vaccination scheme in the Dutch Caribbean?

In answering these questions, the National Immunisation Programme will be regarded as a whole, given the new circumstances. When deciding on elements of the National Immunisation Programme in the future, the Committee will pay separate attention to the Dutch Caribbean.

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### **1.3 Organization of the advice**

In Chapter 2 the methodology of decision-making regarding vaccinations is discussed. Chapter 3 is dedicated to a comparison between the vaccination schemes currently used in the Dutch Caribbean and the European Netherlands, with some remarks on vaccination policy in France and its overseas regions. In Chapter 4 the differences are discussed and the possible expansion of vaccination schemes in the Dutch Caribbean is evaluated. Chapter 5 is dedicated to the matter of possible additional vaccinations that are not part of the current NIP. Chapter 6 provides an overview of the recommendations.



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## The evaluation process

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In this Chapter the Committee presents the seven criteria it uses to decide on the introduction of new vaccinations in the National Immunisation Programme, and discusses how these are applied in the case of vaccination in the Dutch Caribbean.

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### 2.1 Objectives of the Programme

The National Immunisation Programme in the Netherlands is not static. Changes in the epidemiological situation of an infectious disease or the development of new or better vaccines may lead to adaptations. The permanent Committee on the NIP within the Health Council has the task of advising the Minister of Health on possible changes.

The primary objective of the programme is formulated as follows:

*To protect the people and society of the Netherlands against serious infectious disease by means of vaccination.*

In support of the primary objective, three secondary objectives may be identified:

- 1 Elimination of an infectious disease (regionally or worldwide)
  - 2 Achieving and maintaining herd immunity
  - 3 Protection of as many people as possible.
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## 2.2 Criteria for decision-making

To promote clarity regarding the basis on which vaccinations are included in or excluded from the NIP, the Committee has defined earlier seven inclusion criteria.<sup>1,2</sup> These criteria are intended to serve as a means of determining whether it is desirable to include a particular vaccination for a particular target group. Identification of the appropriate target group – the entire population, all infants and young children, or one or more specific groups or subpopulations – is critical to any assessment of the effectiveness, acceptability and efficiency of a vaccination. In practice, assessment will sometimes involve examination and comparison of several options, using the seven criteria for guidance. A multi-option assessment needs to look not only at the merits of vaccinating various possible target groups, but also at various possible vaccination schedules.

The criteria are based on two ethical principles: (1) that the best possible protection should be afforded to the population as a whole and (2) that benefit should be fairly distributed across population groups, with protection provided on the basis of need.

The seven criteria are set out below, grouped under five thematic headings.

### Seriousness and extent of the disease burden

- 1 The infectious disease causes considerable disease burden within the population:
  - The infectious disease is serious for individuals, and
  - The infectious disease affects or has the potential to affect a large number of people.

### Effectiveness and safety of the vaccination

- 2 Vaccination may be expected to considerably reduce the disease burden within the population:
    - The vaccination is effective for the prevention of disease or the reduction of symptoms.
    - The necessary vaccination rate is attainable (if eradication or the creation of herd immunity is sought).
  - 3 Any adverse reactions associated with vaccination are not sufficient to substantially diminish the public health benefit.
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#### Acceptability of the vaccination

- 4 The inconvenience or discomfort that an individual may be expected to experience in connection with his/her personal vaccination is not disproportionate in relation to the health benefit for the individual concerned and the population as a whole.
- 5 The inconvenience or discomfort that an individual may be expected to experience in connection with the vaccination programme as a whole is not disproportionate in relation to the health benefit for the individual concerned and the population as a whole.

#### Efficiency of the vaccination

- 6 The ratio between the cost of vaccination and the associated health benefit compares favourably to the cost-benefit ratio associated with other means of reducing the relevant disease burden.

#### Priority of the vaccination

- 7 The provision of vaccination may be expected to serve an urgent or potentially urgent public health need.

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## **2.3 Applicability**

In answering the questions in this advice, the abovementioned objectives and criteria are fully applicable.<sup>1,2</sup> However, specific epidemiological data on the occurrence of disease in the Dutch Caribbean are scarce, as has already been pointed out. Because of this, it is hard to scientifically establish reasons to deviate from the current Dutch programme. Where eliminating vaccinations is concerned, the Committee will therefore steer on the side of safety. In the following Chapters it will only discuss possible additions to the programme, taking into account the advice of regional experts.



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## Vaccination schemes compared

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How do the existing vaccination programmes in the Dutch Caribbean compare to those in the European Netherlands? And what can we learn from France's vaccination policy regarding overseas regions?

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### **3.1 Vaccination in the European Netherlands and the Dutch Caribbean**

When deciding on future changes in the National Immunisation Programme, the objective will be to protect all inhabitants of the European Netherlands and the Dutch Caribbean equally, while allowing for differences when this is warranted. In this advice, however, the Committee is evaluating the whole vaccination programme in the Dutch Caribbean, given the newly established relationship in the European Netherlands. Table 1 and 2 show the schemes currently in use in these two regions:

Table 1 Vaccination scheme in the European Netherlands (since 1-8-2011)

Age	Vaccine
0 months (< 48 hours)	HepB-0 <sup>a</sup>
2 months	DTaP-IPV-Hib-HepB + PCV
3 months	DTaP-IPV-Hib-HepB + PCV
4 months	DTaP-IPV-Hib-HepB + PCV
11 months	DTaP-IPV-Hib-HepB + PCV
14 months	MMR + MenC
4 years	DTaP-IPV
9 years	DT-IPV + MMR
12-13 years	HPV-1 <sup>b</sup> , HPV-2 <sup>b</sup> (+1 month), HPV-3 <sup>b</sup> (+5 months)

<sup>a</sup> Only for children with a HBsAg-positive mother.

<sup>b</sup> Only for girls.

DTaP: against diphtheria, tetanus and pertussis (acellular vaccine)

IPV: against poliomyelitis, injectible inactivated virus vaccine

Hib: against disease by *Haemophilus influenzae* type b

HepB: against hepatitis B

MMR: against mumps, measles and rubella

PCV: against pneumococcal disease (pneumococcal conjugate vaccine)

MenC: against meningococcal C disease

HPV: against cervical cancer

Table 2 Vaccination schemes for Bonaire, St Eustatius and Saba

Bonaire		St Eustatius		Saba	
Age	Vaccine	Age	Vaccine	Age	Vaccine
				0 months	HepB <sup>a</sup>
2 months	DTP-Hib + OPV <sup>b*</sup>	2 months	DTP-IPV-Hib-HepB	2 months	DTP-IPV-Hib-HepB
3.5 months	DTP-Hib + OPV <sup>b</sup>	3 months	DTP-IPV-Hib-HepB	3 months	DTP-IPV-Hib-HepB
5 months	DTP-Hib + OPV <sup>b</sup>	4 months	DTP-IPV-Hib	4 months	DTP-IPV-Hib-HepB
11 months	DTP-Hib + OPV <sup>b</sup>	6 months	HepB	11 months	DTP-IPV-Hib-HepB
14 months	MMR	12 months	DTP-IPV-Hib + MMR	14 months	MMR
4 years	DT + OPV	4 years	DT-IPV + MMR	4 years	DTaP-IPV
9 years	DT + OPV + MMR	9 years	DT-IPV	9 years	DT-IPV + MMR

<sup>a</sup> Children of HBsAg-positive mothers only.

<sup>b</sup> Will be replaced by a hexavalent vaccine including DTaP-IPV-Hib-HepB.

IPV: against poliomyelitis, injectible inactivated vaccine

HepB: against hepatitis B

Hib: against disease by *Haemophilus influenzae* type b

OPV: against poliomyelitis, attenuated oral vaccine

MMR: against mumps, measles, rubella

The first conclusion that can be drawn from these data is that the similarities prevail. But some differences also present themselves.

The most obvious difference is the absence of three vaccines that are as yet not part of an immunisation programme in the Dutch Caribbean:

- Vaccination against pneumococcal disease
- Vaccination against meningococcal C disease
- Vaccination against human papillomavirus, to protect against cervical cancer.

In addition, there are some smaller differences to be noticed, in terms of timing, such as MMR vaccination at four instead of nine years of age and hepatitis B vaccination given at different ages, or in terms of the type of vaccine that is used, as is the case with the polio immunisation.

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### **3.2 Vaccination in France and its overseas regions**

How have the French organised vaccination in their overseas regions? How do they take into account local policy, and geographical and epidemiological differences? The first observation is that French public health policy is based on centrally made decisions, while Regional Health Agencies are responsible for local public health policy. This is comparable to the situation regarding the Netherlands and the Dutch Caribbean: the central responsibility lies with the Minister of Health, but the newly formed National Service of the Dutch Caribbean also has a role to play.

A second observation is that as a general principle the standard immunisation programme is applied, both on the French mainland and in the overseas regions. However, exceptions to the rule are possible depending on the epidemiological situation. For that purpose, data collection is carried out by regional epidemiological centres. Once again this is comparable to the new Dutch situation: while all citizens have a right to appropriate protection through vaccination, the way to reach this objective may vary as a result of epidemiological differences.

A third observation is that what is geographically remote from the mainland may not necessarily need a different approach, while regions on the mainland itself may warrant a specific vaccination policy. On Martinique and Guadeloupe, for instance, exactly the same vaccination scheme is carried out as on the French mainland. However, based on the recommendations by regional centres, the vaccination scheme in French Guyana has been revised, and the policy regarding hepatitis B vaccination in the Le Havre region on the mainland has been adapted.

Table 3 Vaccination scheme in France

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Age	Vaccine
2 months	DTaP-IPV-Hib-HepB + PCV
3 months	DTaP-IPV-Hib
4 months	DTaP-IPV-Hib-HepB + PCV
12 months	MMR + PCV
16-18 months	DTaP-IPV-Hib-HepB
12-24 months	MenC
13-24 months	MMR
6 years	DT-IPV
11-13 years	DTaP-IPV
14 years	HPV-1 <sup>a</sup> , HPV-2 <sup>a</sup> (+1 or 2 months), HPV-3 <sup>a</sup> (+6 months)
16-18 years	DT-IPV

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<sup>a</sup> Only for girls.

DTaP: against diphtheria, tetanus and pertussis (acellular vaccine)

IPV: against poliomyelitis, injectible inactivated virus vaccine

Hib: against disease by *Haemophilus influenzae* type b

HepB: against Hepatitis B

MMR: against mumps, measles, and rubella

PCV: against pneumococcal disease (pneumococcal conjugate vaccine)

MenC: against meningococcal C disease

HPV: against cervical cancer

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### 3.3 Conclusion

The comparison between vaccination schemes in the European Netherlands and Dutch Caribbean shows that evaluation is required on the possible addition of three vaccinations: vaccinations against pneumococcal disease and meningococcal C disease, and a vaccination to protect against cervical cancer. Also, some matters of differentiation in timing need to be reviewed, as well as the oral polio vaccine used on Bonaire.



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## **Possible introduction of existing national vaccinations**

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Three vaccinations in the current Dutch National Immunisation Programme are not carried out in the Dutch Caribbean, and some other differences have been identified. In this Chapter, the Committee, having called in additional expertise, will consider the possibility of adaptations to the programme on the three islands.

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### **4.1 Vaccination against pneumococcal disease**

Very little is known about the incidence of pneumococcal disease in the Dutch Caribbean. Even for the entire continent of Latin America data is scarce. In two studies an attempt was made to estimate the burden of disease in the Latin America and the Caribbean region. In both cases, however, data from only a small proportion of the countries were used.<sup>3,4</sup>

Extrapolation to the entire region resulted in an estimated incidence of 11 to 12 cases of pneumococcal meningitis per 100,000 children in the age group of five years and younger. This is comparable to the prevaccination era in the Netherlands, which saw an incidence of 11.5 per 100,000 children in the age group of two years and younger.

The incidence of all forms of invasive pneumococcal disease was estimated at 32 cases per 100,000 per year. This is considerably higher than the incidence in the Netherlands before the introduction of pneumococcal conjugate vaccination for children (which was 24,9 per 100,000 per year).

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These data suggest that vaccination is useful, a finding that is in line with the recommendations made by CAREC. Although pneumococcal disease was not a frequent diagnosis over the last ten years, experts from the Dutch Caribbean agree that introduction of vaccination against this disease is useful and feasible. People suffering from sickle cell anaemia, who are at high risk for pneumococcal disease, are already immunised against this type of infection.

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## 4.2 Vaccination against meningococcal C disease

Infections caused by the meningococcus C bacterium are endemic in infants in most populations. In that case, a peak in incidence is seen at the age of 3 to 12 months, when maternal protection has waned. However, there is specific reason for concern when epidemics and outbreaks (defined as three cases of the same serogroup within a region) occur irregularly. This is the case when, for instance, a second peak is seen among adolescents and young adults.

A sudden and persisting rise in the number of cases of meningococcal C disease in the European Netherlands and the availability of a new vaccine prompted an advice, in 2001, to include the vaccination in the NIP.<sup>5</sup> All children are now vaccinated at the age of 14 months, in a one-dose schedule that is appropriate for their age. As a catch-up, all children aged from one and to 18 years inclusive were vaccinated, with one dose. It is likely that this catch-up campaign has contributed considerably to overall population protection against meningococcal C disease in the Netherlands.

Available data suggest the burden of meningococcal disease in the Caribbean is generally very low. PAHO and CAREC do not give a general recommendation for vaccination against meningococcal disease caused by meningococcus C. However, the vaccine is recommended to people travelling to higher risk countries and for students going to the United States of America and Europe, which is a common occurrence. Sometimes vaccination is compulsory for universities.

Therefore, the Committee recommends the inclusion of vaccination against meningococcal C disease in the NIP for the Dutch Caribbean. This will protect travellers and oppose the introduction of meningococcal C disease to the Dutch Caribbean. Introduction of the vaccination is feasible, according to the consulted experts.

In order to reach adequate protection of the population as a whole, a catch-up campaign similar to the one used in the European Netherlands might be needed, since the protection will otherwise be limited to (a growing number of) yearly

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cohorts. However, the choice for an additional catch-up will need to be made on the basis of more than just scientific considerations.

The Committee also discussed vaccination with the broader four valent vaccine which covers serogroups A, C, W and Y. No specific data to support use of this vaccine for the region were found. Therefore, the Committee does not recommend the use of this specific vaccine in a public programme for the Dutch Caribbean.

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### **4.3 Vaccination against cervical cancer**

Cervical cancer is in almost all cases a sequel to the infection with human papilloma virus (HPV), a highly contagious virus that affects 80% of all women. However, of the infected women only a small part will develop cervical cancer.

Since a vaccine against the most oncogenic types of HPV has become available, it is possible to reduce the number of deaths caused by cervical cancer through vaccination. The vaccination has only recently been introduced in the European Netherlands. This has met with opposition from people who have actively campaigned through the (online) media. One of the concerns seems to be that vaccination of young girls could be taken as a licence for promiscuous sexual behaviour.

Where the Dutch Caribbean is concerned, the Committee stresses that there is every reason to add this vaccination to the current programme. Cervical cancer is the second most frequent form of cancer amongst women in the Caribbean, and circulation of the virus does not substantially differ from that in Europe. Because of this, PAHO also recommends HPV vaccination in the region.

Preventive vaccination should be given before the start of sexual activity. The Committee has discussed the advisable age of vaccination with the experts in the region. Although the general impression among these experts is that sexual activity starts at an earlier age in the Caribbean than in the European Netherlands, no data are available to confirm this. As a result, there is no substantial basis to argue that vaccination against HPV on the three islands should be carried out at an earlier age.

The Committee therefore recommends the introduction of vaccination against HPV for girls, which is to be carried out between the ages of 9 and 12. A more specific timeframe could be established when a survey sheds more light on the age at which girls on the islands start to engage in sexual activity.

Although the experts from the Caribbean envisage similar obstacles to HPV vaccination as encountered in the European Netherlands, they underscore the importance of the vaccination. No data on the occurrence of cervical cancer on

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the three islands are as yet available, partly due to the absence of systematic screening, but there is no reason to assume that the statistics will be fundamentally different from those in the European Netherlands. Vaccination can therefore result in significant health benefits.

The absence of systematic screening on the islands, however, is worth addressing. In the European Netherlands, vaccination against HPV was introduced in a situation in which reliable data on the occurrence of cervical cancer is available, since Dutch women between 30 and 60 years of age are invited to participate in screening for cervical cancer every five years. Until now, screening is based on cytology, but in the near future HPV testing will be used for triage, followed by cytology for confirmation.

Ideally, both the vaccination and the screening programme should be introduced simultaneously in the Dutch Caribbean, to achieve the necessary health gains and get the required regional data. However, the implementation of screening will probably take longer than the introduction of the vaccination, since screening asks for specific laboratory facilities. Therefore, the Committee recommends starting off with the vaccination programme, even if no screening is as yet set up. Otherwise too much valuable time would be lost. This should pose no problems, since the two programmes are complimentary and each have their own goals and target age groups.

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#### **4.4 Timing and vaccine type**

The timing of repeat and booster vaccinations shows some variation, compared to that in the European Netherlands. Is it necessary to bring the Dutch Caribbean schedule into alignment with the one currently used in the NIP in the European Netherlands?

The most obvious difference between the Caribbean and European schedules is the second MMR vaccination at 4 years on St Eustatius and 9 years on Bonaire and Saba and in the European Netherlands. Administration at 4 years of age is in accordance to recommendations by WHO, in order to minimize the number of children susceptible to measles.<sup>6</sup> In the Dutch schedule the second MMR vaccination is given at 9 years of age in order to maintain sufficient immunity against rubella at child bearing age. Assessment of the appropriateness of either approach is currently being modelled at the National Institute of Public Health and the Environment (RIVM).

From a practical point of view it could be advantageous to align the schemes of the Dutch Caribbean with that in the European Netherlands. This would also enhance the clarity and consistency of the programme as a whole. In the absence

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of conclusive evidence pro or against existing variations in the vaccination schedules the Committee refrains from a recommendation in this matter. Future changes should aim at alignment of the schedules.

Another type of variation does warrant a recommendation from the Committee. It concerns the administering of an oral polio vaccine (OPV) on Bonaire. With this oral vaccine, there is the rare possibility that the circulating vaccine virus strains become more virulent and induce vaccine-associated poliomyelitis, while the advantage of protecting non-vaccinated people only occurs when the disease is highly endemic. Since the latter is currently not the case, it is more important to reduce all risks of virus circulation.

The Committee therefore strongly advises to change to an intramuscular, inactivated vaccine. Since a hexavalent combination vaccine, containing IPV, DTaP and hepatitis B components is available, this can easily be accomplished.

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## 4.5 Conclusion

Three vaccinations that are currently not included in the Dutch Caribbean vaccination scheme need to be added:

- Vaccination against pneumococcal disease
- Vaccination against meningococcal C disease
- Vaccination against cervical cancer.

The oral polio vaccine currently administered on Bonaire needs to be changed to an intramuscular, inactivated vaccine. Eliminating current variations in the timing of repeat and booster vaccinations could be advisable for the clarity and consistency of the national programme. There is, however, no epidemiological data available to warrant a complete alignment. Local and practical considerations can therefore be taken into account in deciding on this issue.



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## **Possible introduction of other vaccinations**

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What additional vaccinations may be required, specifically for the Dutch Caribbean, that are not part of the National Immunisation Programme? In this Chapter, two vaccinations that are publicly provided in the European Netherlands will be discussed briefly: vaccination against tuberculosis and influenza. To conclude, the Committee also discusses vaccination against gastroenteritis due to rotavirus infection, since this is currently under consideration for inclusion in the NIP.

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### **5.1 Vaccination against tuberculosis**

The burden of tuberculosis in the Caribbean is generally low compared to that in other regions in the world. Unfortunately, epidemiological evidence is, once again, scarce. A source for regional data is The Global Tuberculosis Control Report of WHO.<sup>7</sup> In this report, estimates of several measures of tuberculosis incidence are made, based on modelling on reported disease cases from countries in the region.

In 2007 WHO estimated the incidence of tuberculosis in the former Netherlands Antilles at 7.5 per 100,000 people per year.<sup>8</sup> WHO published higher estimates of the incidence of tuberculosis for the Netherlands Antilles in their newest Global Tuberculosis Control Report (2011), i.e. 54 per 100,000 people per year for 2008 (95 percent uncertainty interval 44-65) and 27 per 100,000 (22-33) for 2009.<sup>7</sup> Most likely these estimated incidences are artefacts of the

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modelling methods, that are not suitable for use on small populations. The estimates in any case do not correlate with the much lower incidences reported by local professionals (S. Baboe-Kalpoë, J. Blaauboer, and I. Gerstenbluth, written communications, 2012). Moreover, in the same 2011 Global Report WHO reported zero (0) new cases for Bonaire, St Eustatius and Saba combined in 2010 and incidences of 4 per 100,000 for Curacao and 9.1 per 100,000 for St Maarten.<sup>7</sup> These data cast further doubt on the accuracy of the incidences reported for the Netherland Antilles as a whole.

At the same time, several risk factors need to be taken into account. Geographically, this is a high risk area for multidrug resistant tuberculosis. Also, illegal residents from countries in the region where tuberculosis is endemic constitute a risk for spreading tuberculosis. Finally, diagnosis of tuberculosis in children is difficult, while tuberculous meningitis and disseminated tuberculosis in young children may take a rapidly progressive and potentially fatal course.

In the European Netherlands BCG vaccination is given to risk groups only: children of parents born in countries where tuberculosis incidence exceeds 50/100,000 per year. Such children may get infected in their social environment at home and when they travel to the country of their parent's origin. At present, this vaccination is not executed through the infrastructure of the NIP, but through a separate programme.

In a recent advice for the European part of the Netherlands, the Health Council reassessed the reasons for vaccination of these children, concluding that BCG vaccination should be continued, and adding to this that inclusion in the NIP would probably lead to higher uptake and better registration.<sup>9</sup> It would also promote awareness and knowledge of the symptoms of tuberculosis among primary health care workers. A ministerial decision upon this advice is still to be reached.

The Committee advises to add targeted BCG vaccination of children of parents born in countries where the tuberculosis incidence exceeds 50/100,000 per year to the vaccination scheme in the Dutch Caribbean. BCG vaccination should not be given to HIV-positive children.

Local experts confirm that targeted vaccination of children at risk of tuberculosis, similarly to the approach in the European Netherlands, is feasible. Health authorities know a lot about the target populations. The specific skills needed for intracutaneous vaccination of BCG are available in local paediatricians or general practitioners.

Additional to the vaccination of children who are at risk, people travelling to countries where tuberculosis is highly prevalent should be advised to take preventive measures, as is currently done in the European Netherlands.

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Depending on the country and the duration of their stay, such measures can be vaccination or Mantoux skin testing before leaving and upon return. People asking for asylum should be screened by the local health services, using the Mantoux test. However, these control measures for (potential) contacts cannot replace BCG vaccination in the prevention of tuberculous meningitis and disseminated tuberculosis in young children.

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## **5.2 Gastroenteritis due to rotavirus infection**

The second additional vaccination to be considered is against gastroenteritis due to rotavirus infection. In one publication, the mortality rate due to rotavirus infection in the Latin American and the Caribbean region was estimated at 88.2 per 100,000 children aged five years and younger, based on 168 studies covering data from 1977-2009.<sup>10</sup>

This estimate seems high, and it is likely that the mortality rate for the Dutch Caribbean may be lower. Local professionals report that not much is known regarding the burden of disease caused by rotavirus. Episodes of diarrhoea occur, but the causative pathogen usually remains unknown. For this reason, it will be important to set up adequate surveillance, in order to gain better insight in the prevalence of the different causes of infant diarrhoea.

For countries in which such surveillance is in place, some data is available on the effects of introduction of rotavirus vaccination on the occurrence of diarrhoea in children. Diarrhoea due to rotavirus infection substantially decreased in El Salvador, where vaccine coverage is high (92%). A similar decrease was not observed in Venezuela, where coverage is lower (49%).<sup>10</sup>

The Health Council is currently assessing inclusion of vaccination against gastroenteritis due rotavirus infection in the Dutch NIP. It makes sense to wait for the outcome of that evaluation and for the subsequent decision made by the Minister of Health, although, in concurrence with PAHO recommendations, introduction of the vaccination in the Dutch Caribbean could also precede possible introduction in the European Netherlands. In any case, the choice of a possible vaccine should be well adapted to the region, as serotypes of the virus may differ from those in Western Europe.

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## **5.3 Influenza**

In the European Netherlands, influenza vaccination is provided through the National Programme of Influenza Prevention and administered to members of

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medical risk groups and to all persons aged 60 years and over. The programme is executed by general practitioners and is free of charge for the participants.

Influenza and influenza vaccination have no high profile in tropical countries. Seasonal influenza in temperate climates typically occurs in winter, but seasonality is less defined in tropical regions. There are some indications that influenza is regularly mistaken for dengue, and may be an underappreciated public health problem in tropical regions.

This advisory report focuses on the applicability of the childhood vaccination programme. The applicability of the National Programme of Influenza Prevention to the Dutch Caribbean should be assessed separately.

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## **5.4 Conclusion**

Where tuberculosis is concerned, it is recommended to add targeted BCG vaccination of children of parents born in countries where the tuberculosis incidence exceeds 50 per 100,000 per year to the vaccination scheme in the Dutch Caribbean. This vaccination should not be given to HIV-positive children.

The Health Council is currently assessing inclusion of a vaccination against gastroenteritis due rotavirus infection in the Dutch NIP. It makes sense to wait for the outcome of that evaluation, and for the subsequent decision made by the Minister of Health.

If the applicability of the National Programme of Influenza Prevention to the Dutch Caribbean is to be judged, a separate assessment is needed.

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# Advice

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## 6.1 Recommendations for alignment of the current programmes

There are no epidemiological data that support differentiation

The scarce epidemiological data on the occurrence of the relevant diseases in the Dutch Caribbean have not presented the Committee with fundamental reasons to differentiate between the National Immunisation Programme in the Dutch Caribbean and the European Netherlands. The Committee therefore recommends to bring the programme for the islands of Bonaire, St Eustatius and Saba into alignment with the NIP as it is carried out in the European Netherlands.

Three vaccinations need to be added in the Dutch Caribbean

This means that three vaccinations currently not included in the Dutch Caribbean scheme should be added:

- Vaccination against pneumococcal disease
- Vaccination against meningococcal C disease
- Vaccination against cervical cancer.

Where prevention of cervical cancer is concerned, it is not just vaccination that needs to be implemented in the Dutch Caribbean. Screening of women between the ages of 30 and 60 is another important tool which should be introduced. This

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will also help the gathering of data. Potential difficulties in implementing one of the two preventive options should not delay implementation of the other.

One adjustment in the type of vaccine administered needs to be made. The oral polio vaccine currently used on Bonaire needs to be changed to an intramuscular, inactivated vaccine.

Eliminating existing variations in the timing of repeat and booster vaccinations could be advisable for the clarity and consistency of the national programme. There are, however, no epidemiological reasons for complete alignment. Local and practical considerations can therefore be taken into account where timing is concerned.

#### Slight variations should remain possible

Although the NIP is fully applicable to the Dutch Caribbean, it does not need to be rigidly applied. Slight variations of vaccination schemes for practical reasons should remain possible, as long as the protection of the inhabitants is not at stake. Also, circulation of different strains or serotypes of pathogens in the region may call for the procurement of vaccines from other providers than the ones in Europe.

In future advisory reports on the National Immunisation Programme the applicability to the Dutch Caribbean will be a special point of focus.

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## **6.2 Recommendations for additional vaccinations outside the NIP**

### Targeted vaccination against tuberculosis is recommended

In the European Netherlands specific risk groups receive a vaccination against tuberculosis. The Committee recommends adding a similar targeted BCG vaccination to the programme in the Dutch Caribbean. This entails: vaccinating children of parents who were born in countries where the tuberculosis incidence exceeds 50 per 100,000 per year. The vaccination should not be given to HIV-positive children.

Vaccination against rotavirus infection is under consideration

The Health Council is currently assessing inclusion of a vaccination against gastroenteritis due to rotavirus infection in the Dutch NIP. It makes sense to wait for the outcome of that evaluation, and for the subsequent decision made by the Minister of Health.

Applicability of the National Influenza Programme needs a separate assessment

If the applicability of the National Programme of Influenza Prevention to the Dutch Caribbean is to be judged, a separate assessment is needed.

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### **6.3 Recommendations for a better infrastructure**

Facilities for diagnosis and surveillance need to be available

Good laboratory facilities and rapid diagnostic tests are needed for diagnosis and surveillance of vaccine preventable diseases, thus also helping to gather epidemiological information. Access to such facilities should be guaranteed on Bonaire, St Eustatius and Saba themselves, on other islands in the region, or in collaboration with other institutions outside the region. Also, a surveillance system for adverse events after vaccination should be put in place. The Netherlands Pharmacovigilance Centre Lareb provides a framework for doing so.

Cooperation and the exchange of expertise are necessary

The Committee encourages the exchange of expertise between professionals in the Caribbean region and the European Netherlands. This could be achieved by having experts from the European Netherlands participate in meetings about the Expanded Program on Immunization (EPI) of the Dutch-Caribbean islands and Aruba, Curacao and St Maarten, and by having regional experts and members of PAHO/CAREC participate in meetings of the Health Council Committee on the NIP.



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# Literature

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  - 2 Houweling H, Verweij M, Ruitenberg EJ. Criteria for inclusion of vaccinations in public programmes. *Vaccine* 2010; 28: 2924-2931.
  - 3 O'Brien KL, Wolfson LJ, Watt JP, Henkle E, Deloria-Knoll M, McCall N et al. Burden of disease caused by *Streptococcus pneumoniae* in children younger than 5 years: global estimates. *Lancet* 2009; 374(9693): 893-902.
  - 4 Valenzuela MT, O'Loughlin R, De La HF, Gomez E, Constenla D, Sinha A et al. The burden of pneumococcal disease among Latin American and Caribbean children: review of the evidence. *Rev Panam Salud Publica* 2009; 25(3): 270-279.
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  - 6 WHO. WHO recommendations for routine immunizations - summary tables (consulted 16 May 2012). 2012. Internet: [http://www.who.int/immunization/policy/immunization\\_tables/en/index.html](http://www.who.int/immunization/policy/immunization_tables/en/index.html).
  - 7 World Health Organization. Global Tuberculosis Control Report 2011 (consulted 11 July 2012). 2011. Internet: [http://www.who.int/tb/publications/global\\_report/en/index.html](http://www.who.int/tb/publications/global_report/en/index.html).
  - 8 World Health Organization. Global Tuberculosis Control Report 2007 (consulted 2011). 2007. Internet: [http://www.who.int/tb/publications/global\\_report/2007/en/index.html](http://www.who.int/tb/publications/global_report/2007/en/index.html).
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- 9 Health Council of the Netherlands. Vaccination of children against tuberculosis. Report nr. 2011/04 (in Dutch). The Hague: Health Council of the Netherlands; 2011. Internet: <http://gr.nl/nl/adviezen/vaccinatie-van-kinderen-tegen-tuberculose>.
- 10 CDC. Progress in the introduction of rotavirus vaccine - Latin America and the Caribbean, 2006-2010 (consulted 16 May 2012). MMWR 2011; 60: 1611-1614.



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A Request for advice

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B The Committee and other experts consulted

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## Annexes



# A

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## Request for advice

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On 24 June 2011 the Minister of Health, Welfare and Sport approached the President of the Health Council for advice concerning the National Immunisation Programme in the Dutch Caribbean. The following is an extract from the Minister's letter (reference: PG/CI/3067024):

Last year as a consequence of a constitutional change the islands Bonaire, Saba and St Eustatius became part of the Netherlands. That means that I have a responsibility for public health on the islands. In the health regulations now in place it reads that the inhabitants have a right to protection by the National Immunisation Programme (NIP). The current Dutch programme is part of the regulations.

I would like to request you to assess the current NIP against the background of the specific epidemiological situation in the region and on the islands. I explicitly request you to involve local experts and experts of PAHO.

The Minister for Health, Welfare and Sports,

(signed)

Mrs. E.I. Schippers MSc

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## The Committee members and other experts consulted

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### National Immunisation Programme Committee

- Prof. E.J. Ruitenberg, *chairman*  
Emeritus Professor of Immunology, University of Utrecht; Professor of International Public Health, VU University Amsterdam
  - Prof. J.J. Roord, *vice chairman*  
Professor of Paediatrics, VU University Amsterdam
  - Prof. W. van Eden  
Physician-Microbiologist / Professor of Veterinary Immunology, University of Utrecht
  - Prof. R. de Groot  
Professor of Paediatrics, University of Nijmegen
  - Prof. E. Hak  
Professor of Clinical Pharmaco-Epidemiology, University of Groningen
  - Dr. T.G.W.M. Paulussen  
Sector Head, Health Promotion, TNO Quality of Life, Leiden
  - Prof. M.J. Postma  
Professor of Pharmaco-Economics, University of Groningen
  - Dr. H.C. Rümke  
Paediatrician-Epidemiologist, Vaccine coordinator, Netherlands Pharmacovigilance Centre Lareb, 's-Hertogenbosch
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- Prof. J.L. Severens  
Professor of Medical Technology Assessment, Erasmus University  
Rotterdam
- Prof. B.H. Stricker  
Professor of Pharmaco-Epidemiology, Erasmus University, Rotterdam
- Prof. S.P. Verloove-Vanhorick  
Professor of Preventive and Curative Health Care for Children, University of  
Leiden; TNO Quality of Life, Leiden
- H.J. Vermeulen-Schakel  
Public Health Physician, Municipal Health Service (GGD) Kennemerland,  
Hoofddorp
- Dr. M. Verweij  
Ethicist, Ethics Institute, Utrecht University
- Prof. H.L. Zaaijer  
Professor Blood-borne infections, Academic Medical Centre and Sanquin,  
Amsterdam
- Dr. M.A.E. Conyn-van Spaendonck, *advisor*  
Physician-Epidemiologist, Manager of the NIP, National Institute of Public  
Health and the Environment, Bilthoven
- Dr. H.E. de Melker, *advisor*  
Epidemiologist, National Institute of Public Health and the Environment,  
Bilthoven
- Dr. A.C.G. Voordouw, *advisor*  
Physician, MPH, Medicines Evaluation Board (CBG), The Hague
- Dr. P. van Dalen, *observer*  
Ministry of Health, Welfare and Sport, The Hague
- Dr. H. Houweling, *scientific secretary*  
Physician-Epidemiologist, Health Council, The Hague
- Dr. M.F.M. Langelaar, *scientific secretary* (until 15 April 2012)  
Veterinarian-Immunologist, Health Council, The Hague

#### The Health Council and interests

Members of Health Council Committees are appointed in a personal capacity because of their special expertise in the matters to be addressed. Nonetheless, it is precisely because of this expertise that they may also have interests. This in itself does not necessarily present an obstacle for membership of a Health Council Committee. Transparency regarding possible conflicts of interest is nonetheless important, both for the chairperson and members of a Committee

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and for the President of the Health Council. On being invited to join a Committee, members are asked to submit a form detailing the functions they hold and any other material and immaterial interests which could be relevant for the Committee's work. It is the responsibility of the President of the Health Council to assess whether the interests indicated constitute grounds for non-appointment. An advisorship will then sometimes make it possible to exploit the expertise of the specialist involved. During the inaugural meeting the declarations issued are discussed, so that all members of the Committee are aware of each other's possible interests.

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**The Committee consulted the following experts and institutes:**

- V. Asin Oostburg MD, EPI Manager, Collective Prevention Services Ministry of VSA, Philipsburg, St Maarten
- S. Baboe-Kalpoë, MD, Public Health Department St Eustatius, Dutch Caribbean
- J. Blaauboer MD, Family Physician, A.M. Edwards Medical Center The Bottom, Saba, Dutch Caribbean
- I. Gerstenbluth MD, Epidemiology & Research Unit, Communicable Diseases Unit Ministry of Health, Curacao
- H.A. Hooijkaas MD, Head Immunization Department, Department of Child & Youth Care, Ministry of Health, Environment and Nature, Curacao
- J. Hubert MD, Head Youth Health Care Section, Department of Public Health, Oranjestad, Aruba
- B. Irons MD, Regional Advisor/Epidemiologist, EPI-CAREC, Trinidad and Tobago
- C. Jack-Roosberg, EPI Manager, Head Public Health Department, St Eustatius, Dutch Caribbean
- M. Landaverde MD, Pan American Health Organization, Washington, USA
- M. Martina, Ministry of Public Health, Social Development and Labor, Philipsburg, St Maarten
- J. van Slobbe, EPI Manager, Department of Public Health, Bonaire, Dutch Caribbean
- A. Vicari MD, Advisor, Pan American Health Organization, San Jose, Costa Rica

