Ministry of Foreign Affairs of the Netherlands

IOB Evaluation

Turning a right into practice

Impact evaluation of the Ixchen Centre for Women cervical cancer programme in Nicaragua (2005-2009)

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October 2012

Preface

For a long time, the Netherlands has been committed to promoting sexual and reproductive health and rights (SRHR). The Netherlands has taken a leading role in defending a rights-based approach towards sexual and reproductive health in the international arena and has voiced concerns on sensitive topics such as unsafe abortion, the rights of adolescents and the rights of sexual minorities. The 2011 focus letter on Dutch development cooperation priorities selected SRHR as one of the key areas and a number of expected results were defined in the letter.

The Policy and Operations Evaluation Department (IOB) of the Dutch Ministry of Foreign Affairs is currently carrying out a policy review of Dutch involvement in SRHR, roughly during the period 2007-2011, emphasizing the results that have been obtained. The review includes SRHR programs executed by multilateral organisations, through bilateral cooperation and with support to civil society organisations.

The present evaluation is part of the assessment of bilateral cooperation programs and will be one of the building blocks for the forthcoming policy review. The study addresses the prevention and treatment of cervical cancer, a major reproductive health problem in Nicaragua. It focuses on remote rural areas where the local NGO 'Ixchen' - in collaboration with the Ministry of Health - has introduced a new approach for translating the right to reproductive health into practice. Both quantitative and qualitative research methods have been applied to identify the impact of this approach. The results of the study confirm that the interventions for screening and treating cervical cancer yield substantial net effects for treated clients, even while knowledge levels remain low. The study calculates that the number of lives saved through the programme amounts to 6,500-12,500 at a cost per life saved ranging between US$ 55 to US$ 348.

IOB senior evaluator Marijke Stegeman and IOB researcher Saskia Hesta conduct the SRHR policy review. A consortium of four agencies (ETC Crystal, Ecorys, the Royal Tropical Institute and the Rural Development Centre) has been contracted to carry out robust impact studies in two countries: Mali and Nicaragua.

The Nicaraguan evaluation team composed of Hermen Ormel, Angélica Ramírez Pineda, Zaira Pineda, Meg Braddock, Esther Jurgens, Alejandro Uriza, Vivian Alvarado, Koen Voorend, Mary Luz Dussan, Julio Ortega Betanco and Hans Nusselder.

The study is not just a product of the evaluation team. It is the result of a joint effort of many people and organisations. It would have been impossible to analyse the impact of the programme without the clients of the Ixchen Centre for Women's programme, who agreed to share their stories with the team.

The staff of Ixchen and Profamilia, the personnel of the Nicaraguan Ministry of Health at the national level and in the Managua, Matagalpa and Nueva Segovia departments, the communities, local authorities and members of the National Alliance for Cervical Cancer Prevention complemented the surveys and interviews with their valuable input as key informants.

The Ministry's Institutional Ethical Review Committee provided its ethical endorsement so that the study could be conducted.

Throughout the process, colleagues from the consortium and the Health Research and Study Centre (CIES) provided input and suggestions for revision, especially Miguel Orozco, Jos Vaessen, Anna Rivas, Joanne Harnmeijer, Leon Bijlmakers and Arthur ten Have. Senior evaluator Phil Compernolle (IOB) peer reviewed the final report and gave suggestions for revision.

Both in Nicaragua and in the Netherlands a reference group provided comments and technical suggestions. The Nicaraguan reference group consisted of representatives of the Ministry of Health, the Nicaraguan Society of Obstetrics and Gynaecology, the Pan American Health Organization, the Spanish Agency for International Development Cooperation, representing the donor community, and finally, the Embassy of the Kingdom of the Netherlands. The reference group in the Netherlands consisted of representatives of the policy division DSO/GA of the Netherlands Ministry of Foreign Affairs and two external experts, Mariette Wiebenga and Rob Baltussen.

I would like to thank all these people who contributed to the study.

The final responsibility for the content of the publication rests with IOB.

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Policy and Operations Evaluation Department (IOB)
Ministry of Foreign Affairs

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Acronyms and abbreviations

CaCu	Cervical cancer
CDR	Centro de Estudios para el Desarrollo Rural (Rural Development Studies Centre)
CIES	Centro de Investigaciones y Estudios de la Salud (Health Research and Studies Centre)
CIN	Cervical intraepithelial neoplasia
CLT	Early lesion treatment clinic
DNA	Deoxyribonucleic acid
ENDESA	Nicaraguan Demographic and Health Survey
ENSSR	National Strategy on Sexual and Reproductive Health
HGSIL	High-grade squamous intraepithelial lesion
HIV	Human immunodeficiency virus
HPV	Human papilloma virus
INSS	Instituto Nicaragüense de Seguridad Social (Nicaraguan Social Security Institute)
IUD	Intrauterine device
KIT	Royal Tropical Institute (of the Netherlands)
LEEP	Loop electrosurgical excision procedure
LGSIL	Low-grade squamous intraepithelial lesion
MINSA	Ministry of Health
MOSAFC	Model for Family and Community Health
NGO	Non-governmental organisation
PAHO	Pan-American Health Organization
Pap	Papanicolaou smear
PASMO	Pan American Social Marketing Organization
PSI	Population Services International
SILAIS	Local comprehensive health care systems
SIVIPCAN	Surveillance system for prevention of women's cancer
SONIGOB	Nicaraguan Society of Obstetricians and Gynaecologists
SRH	Sexual and reproductive health
SRHR	Sexual and reproductive health and rights
STI	Sexually transmitted infection
UNAN	Universidad Nacional Autónoma de Nicaragua
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNRISD	United Nations Research Institute for Social Development
VIA	Visual inspection with acetic acid
WHO	World Health Organization

Executive summary

Introduction

The evaluation presented here is one of the building blocks for a review of Dutch policy in the field of sexual and reproductive health and rights (SRHR). This review addresses the relevance, efficiency and effectiveness of Dutch-supported programmes, including impact studies in Bangladesh, Ghana, Mali, Nicaragua and Tanzania.

The government of the Netherlands has provided support to partners in the Nicaraguan health sector for many years. Total Dutch investment in programmes dealing with sexual and reproductive health and rights was over US$33 million in the period from 2005 to 2009. Investments include support for governmental, non-governmental and multilateral initiatives.

In 2010, the governments of Nicaragua and the Netherlands selected the 'Sectorial Programme for Cervical Cancer Prevention and Care' as the topic for the Nicaraguan impact study. The programme was implemented in the period from 2005 to 2009 by the non-governmental organisation ***Centro de Mujeres Ixchén***, in collaboration with the Nicaraguan Ministry of Health. Ixchen fully agreed to participate in the assessment. The current document presents the findings of this study.

The intervention

In 2005 the Nicaraguan National Alliance for Cervical Cancer Prevention developed a project proposal to address the high incidence rate of cervical cancer (the highest in Central America), the increase over the previous decade of the mortality rate associated with the illness and the limited screening coverage. The programme consisted of two components, one under the auspices of the Nicaraguan Ministry of Health and one to be implemented by Ixchen, in collaboration with the Ministry of Health. The Dutch government agreed to make funding available for both components.

The programme component implemented by Ixchen aimed to enhance the sexual and reproductive health of disadvantaged women in 75 remote municipalities, by improving screening for and treatment of cervical cancer. Specifically, the objectives were:

- To improve the knowledge and attitudes of women and men regarding the need to prevent cervical cancer;
- To progressively increase the coverage of cervical cancer screening (Pap smears) among women aged 20-64;
- To ensure opportune diagnosis and treatment of early-stage lesions and STIs detected among service clients;
- To guarantee palliative treatment for women diagnosed with invasive cancer; and
- To strengthen the institutional capacities of the Ministry of Health and civil society organisations to work within a sectoral approach to prevent cervical cancer through the development of a demonstration project on comprehensive care for women.

The programme focused on poor women living in rural communities in the 75 selected municipalities where the Ministry of Health experienced limited coverage of cervical cancer screening. In addition, the programme also covered disadvantaged groups in urban centres at the request of the Ministry and local authorities. Overall, Ixchen provided information, education and sensitisation activities, thus raising awareness among women and men of the importance of their sexual and reproductive health, and their right to demand services of good technical quality and humane treatment (rights-based approach).

The operational strategy of the programme consisted of mobile teams visiting remote communities, in coordination with the Ministry's static services. Ixchen staff offered the regular programme services, such as education sessions, gynaecology consultations and Pap smears. In areas where the Ministry had no nearby health facility, its staff accompanied the mobile units in order to provide a broader range of coverage such as mother and child health services.

The Pap smear results were made available to the women at subsequent visits. Women with a positive diagnosis were referred to Ixchen's early lesion treatment clinics or those of its partner Profamilia. There, a colposcopy and biopsy would be conducted to confirm the diagnosis. Those with early lesions would then be treated in the same clinic, while those with advanced lesions would be referred to the Ministry's regional or national hospitals for appropriate treatment.

Methodology

The overall objective of the study was to evaluate the impact of the Cervical Cancer Prevention and Care Programme implemented by Ixchen and the Ministry of Health over the period 2005–2009. The study questions focused on the following issues:

- The effect of the intervention in terms of cervical cancer screening coverage (Pap smears), compared to the no-intervention situation (***net effect***), and the factors explaining this effect;
- The effect on knowledge of and attitudes to cervical cancer and other sexual and reproductive health and rights issues , and on the use of other sexual and reproductive health services;
- The net effect of the intervention in terms of the number of people correctly treated, and the factors explaining this effect;
- The results of the programme in terms of public-private partnership;
- Cost-effectiveness of the intervention; and
- Unexpected effects of the intervention.

The study was set up as an impact evaluation with (partly) a counterfactual analysis, combining both quantitative and qualitative research methods. Quantitative methods included a representative survey among 634 Ixchen clients (including clients with negative and positive screening results), an analysis of the database of 4,432 clients with a positive screening result and a cost-effectiveness analysis. This was complemented by the qualitative part consisting of 79 interviews, including 21 Ixchen clients, 13 family members of clients, 11 non-clients, 24 staff of Ixchen, Profamilia and Ministry of Health and 10 key informants, as well as five case studies.

Main findings

*1. The intervention resulted in a substantial **net effect** regarding cervical cancer screening coverage.*
Of the more than 66,000 women who were reached for Pap smears, between 42,000 and 46,000 can be attributed to the programme, i.e. 63%–69%. In addition, the programme also appears to have succeeded in establishing a positive medium-term effect: in the three-year period after the intervention, Pap smear coverage among clients was 14–15 percentage points higher than in the three-year period preceding the intervention.

Factors explaining these effects confirm the high importance of educating and sensitizing women on sexual and reproductive health issues, such as family planning. Pregnancy is also a factor positively associated with seeking Pap smears, while the opposite is true for having small children because the attention children demand and the difficulty women have finding alternative care (or bringing the children along, which may imply costs) may prevent them from seeking services.

Interestingly, support from male partners appears to have had no effect on women's decision to attend cervical cancer screening services. Women indicated they are the ones deciding whether to seek health services and that partners have no influence on this, even though generally most women expressed rather traditional views on gender roles. However, it is important to realise that non-clients were not included in the survey, and it cannot be ruled out that their partners did influence their non-use of the Pap smear services.

The majority of women qualified the services rendered by Ixchen as very good to excellent. Reasons given include the fact that the Ixchen health staff is female and from outside the community, as well as the privacy and confidentiality offered. Meanwhile, not all clients were satisfied with the information they received and the limited opportunity to ask questions; this may be an indication that high demand and ambitious targets make it difficult to live up to the desired quality of care and attention to rights and gender-based issues.

2. The programme succeeded in motivating women to seek services they otherwise would not have sought.
Many of the female clients over 36 years of age had their first sexual and reproductive health consultation of their lives during the Ixchen intervention period, suggesting that their first Pap smear may have led them to seek additional services. Also, the majority of women with a positive screening outcome and over half of the women with a negative outcome went for subsequent sexual and reproductive health services, mostly Pap smears and gynaecological consultations. The majority of the women sought these services in public health facilities. Interestingly, having a job generating an income had no effect on the likelihood of seeking additional services.

3. The knowledge levels regarding cervical cancer were and remained low, and there was little difference between Ixchen clients and non-clients.
Despite the programme goals of improving knowledge and attitudes, Ixchen's educational sessions did not have a significant effect while the knowledge transfer during the Pap smear examination may have been too limited. The educational intervention activities have thus not

increased clients' knowledge of cervical cancer or other sexual and reproductive health aspects, nor have they helped to dispel prejudices. Women indicated that the knowledge they possessed of cervical cancer and Pap smears was obtained from various sources and mostly already existed prior to the arrival of the Ixchen mobile units. Even though this does not mean that this method is generally ineffective, the Ixchen educational approach may need revising.

4. *For a substantial proportion of clients referred for treatment, information on follow-up by subsequent services is unknown.*

For 60% of clients referred for treatment it is not known whether they completed treatment or not. This explains the wide range in the estimate of life years saved, below. The majority of these clients either did not turn up for their check-up half-way through the treatment process (possibly due to lack of appropriate information), or they got lost in the follow-up system due to an inadequate referral tracking system.

5. *The intervention had a significant, positive effect on the number of women treated for cervical cancer. This contributes to a high number of life years saved, partly attributable to the programme.*

As a consequence of the intervention–attributable effect on Pap smear coverage, a minimum of 500 women additionally accessed treatment for early and advanced cervical cancer. The number of properly treated women would rise to 1,200 if the total included not only the women attending the mobile units but also those referred by MINSA and other services to Ixchen.

Factors facilitating the start and completion of treatment include clear information, free services, caretaker support for children and financial support. Meanwhile, the following treatment barriers were identified: lack of caretaker support for children and lack of money to pay for costs associated with treatment.

The total number of life years saved through the programme amounts to 6,500 – 12,500, based on the 40% of clients with known treatment outcomes. If all women referred for treatment but who's follow-up was not documented did in fact receive appropriate treatment, this number increases up to 42,700.

6. *The results of the public-private partnership between governmental and non-governmental organisations show a mixed picture. Weak points included inadequate transfer of skills and approaches between programme partners and lack of coordination at the national and local comprehensive health care systems (SILAIS) levels.*

There was good reason to establish the programme as a collaborative effort between public and non-governmental entities. Policy-level synergies were positive, albeit indirect. They included some decision making on priority interventions and the development of new policies and protocols. Ixchen and Ministry staff agreed to travel together and thus bring a wider range of services to the remote locations they visited. In addition, at the service level, half of the women with positive screening results that Ixchen sent for treatment had been referred by Ministry of Health clinics and this significantly contributed to cost-effectiveness. Meanwhile, the lack of coordination and interaction at the national and decentralevels prevented the envisaged capacity development on issues like rights perspective, education sessions and technical norms for screening and taking Pap smears from materialising.

7. *The programme was cost-effective and the public-private partnership contributed to this. Yet, there is scope for improving cost-effectiveness and user-friendliness by adopting the latest screening strategy insights.*

The cost per life year saved was calculated as potentially ranging from US$55 to US$348, depending on various assumptions. This was less than Nicaragua's gross domestic product (GDP) per capita (US$994); GDP has been proposed as the best cost-effectiveness indicator although there is no agreement on a universal definition. Different (and not always comparable) strategies in five other countries showed a cost per life year saved ranging from US$10 to US$1,093.

Compared to other Nicaraguan cervical cancer screening programmes, the cost of Ixchen's programme is relatively high due to the screening method used and the explicit intention to reach out to disadvantaged women in remote communities. Cost-effectiveness could be improved considerably by (i) adopting the one-visit approach using visual inspection and immediate cryotherapy, recently approved by the Ministry of Health, which in addition would be much more user-friendly; (ii) expanding the range of services offered by the mobile teams; and (iii) focusing on a more targeted age range.

Issues

The findings suggest a number of issues that will require further attention, notably:

- A rights and gender-based approach and women's information needs could possibly be jeopardised by a programme's ambitious coverage targets;
- Reflexion is needed on the awareness-raising and educational approaches used and the role community leaders could play, so as to increase knowledge about cervical cancer and women's sexual and reproductive health and rights and how to address socio-cultural barriers. The quantative part of the impact study did not look into the knowledge levels of non-clients, thereby making it difficult to ascertain the specifics of the approach taken and its effect on increased knowledge;
- More attention should be paid to gender-sensitive aspects in the provision of sexual and reproductive health services through the public health care system, including the involvement of more female medical staff in cervical cancer screening programmes;
- Cervical cancer screening and care programmes require standardized and rigorous data collection and management systems, addressing referral and counter-referral aspects with collaboration by all public and private partners involved. This will assist women throughout the process until their final check-up for completion of treatment;
- Gains can possibly be made at local levels in case local authorities and community-based organisations would jointly address barriers impeding women's access to sexual and reproductive health services, including transport costs and child care;
- The Ministry of Health's health management information system would benefit from coordinated monitoring and evaluation reflecting also non-governmental coverage data in decentralised and national indicators; and
- There is scope for considerable improvement in the cost-effectiveness of cervical cancer screening in Nicaragua.

Ixchen banner at the entrance of Palo Quemado school, 2011, Hermen Ormel/KIT

1 Introduction

This study forms part of a series of impact assessments[1] on the topic of sexual and reproductive health and rights (SRHR) conducted by the Policy and Operations Evaluation Department (IOB) of the Ministry of Foreign Affairs of the Netherlands. The studies aimed at identifying the relevance, effectiveness and efficiency of the Netherlands' contribution in certain countries, including Nicaragua, Mali, Bangladesh, Ghana and Tanzania. The work focused on the results (in terms of, for example, access, utilisation and quality of services) of the SRHR programmes supported by the Netherlands between 2004 and 2009.[2]

The study in Nicaragua was carried out in 2010 and 2011 in two phases, the first aimed at identifying the purpose of the impact assessment and designing the relevant methodology (completed in 2010), and the second focusing on the implementation of the study (completed in 2011).

Outline of Dutch support for the health sector

The Netherlands has for many years been one of the major donors to the health sector in Nicaragua, as reflected in the role of the Embassy of the Kingdom of the Netherlands in leading donor coordination on the SRHR topic. The support by the Netherlands was channelled through the pooled financing for health (Nicaraguan Health Fund, FONSALUD), and support for multilateral organisations and civil society.

During the period covered, this support emphasised the promotion and awareness of gender rights and equity, participation by women and improvement of access to high-quality health services. In particular, efforts focused on the topics of SRHR, HIV and sexually transmitted infections (STI). Table 1.1 shows the total expenditure on health and SRHR by the Netherlands in Nicaragua from 2005 to 2009.

Since support for the sector was analysed in previous evaluations, it was decided that the study would focus on support by the Netherlands for the United Nations Population Fund (UNFPA) and non-governmental organisations (NGOs).

Initial phase: Selection of the intervention for the impact study

As a first step, in 2010 the evaluation team assessed the potential of the five largest programmes supported by the Netherlands during the period covered by the study (included in table 1.1) for inclusion in the impact evaluation. This preliminary evaluation was conducted on the basis of criteria relating to their importance for Nicaragua and for Dutch cooperation policies on SRHR, and of the feasibility of carrying out a rigorous impact study. Given that the programmes were in complementary but diverse areas of SRHR and did not include common strategies, it was felt that the most feasible approach to conducting an impact assessment would be to select an individual programme for more detailed study.

[1] An impact assessment seeks to answer the cause–effect question 'What results are directly attributable to the intervention?' This requires a counterfactual analysis.

[2] However, the evaluation period for the programme selected in Nicaragua is from 2005 to 2009, in line with the implementation of phase 1 of the Ixchen programme.

Table 1.1 Dutch investments in SRHR, 2005–2009 (in US$1,000)	
Activity	**Quantity**
Bilateral sector support (for the implementation of the Ministry's five-year plan (2005–2009)	18,400
Financial support to UNFPA (support for commodity security on the Atlantic Coast)	5,415
Financial support for UNICEF (overall country project and programme support)	3,559
Direct project support in areas of cervical cancer prevention, implemented by Ixchen in cooperation with the Ministry of Health	2,402
NGO funds for SRHR to continue the dialogue among NGOs and between NGOs and the government	750
Other NGO projects, including social marketing of condoms by PSI/PASMO	2,708
Other	426
Total	**33,660**

Source: Information system of the Ministry of Foreign Affairs, The Hague, and the Embassy of the Kingdom of the Netherlands, Managua.

On the basis of criteria set forth in the report of the initial phase[3], as well as of discussions with national actors including the Ministry of Health and the project implementing agencies, representatives of the Ministry of Foreign Affairs of the Netherlands, the Embassy of the Kingdom of the Netherlands and development partners, the programme for the prevention and treatment of cervical cancer implemented by Ixchen in conjunction with the Ministry of Health was selected as the experience to be evaluated in the impact study.

[3] See Inception Report, December 2010 (Braddock 2010).


NICARAGUA
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Mosquitos
NUEVA SEGOVIA
JINOTEGA
Cordillera Isabelia
Ocotal
Somoto
MADRIZ
ESTELÍ
Estelí
Jinotega
Matagalpa
Río Grande
Costa de
CHINANDEGA
LEÓN
MATAGALPA
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Jinotepe
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San Carlos
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San Juan
BELIZE
HONDURAS
EL SALVADOR
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COSTA RICA
PANAMA
2

Context

Description of the context

Country context and health indicators

Nicaragua has a population of 5.9 million and is the second poorest country in Latin America and the Caribbean. Almost half the population lives below the poverty line.[4] Per capita gross domestic product is US$2,641.[5]

There are high levels of inequality, including income inequality and service access inequality between rural, peri-urban and urban areas, as well as gender inequity.[6] Over the last decade, annual population growth has been 1.4% a year, similar to that of other Central American countries. Average life expectancy is 74 years.[7]

Nicaragua's infant mortality indicator (26 per 1,000 live births)[8] is higher than the average for Latin America and the Caribbean. Infectious diseases are a source of great concern for the country. The incidence of tuberculosis, which has been widely viewed as a poverty-related disease, is the third highest in the Central American region (incidence of 23 cases per 100,000 people).[9]

Context of sexual and reproductive health and rights

Inequality in health terms is closely related to socio-economic conditions and access to health services. The poorest have higher fertility rates and bigger families, as well as a higher maternal mortality ratio and child mortality rate. While the total fertility rate has fallen significantly from 4.9 children per woman in 1995 to the present 2.7 children per woman, it is still among the highest in the region, while there are also many differences in terms of geographical zones and income levels.[10]

The contraceptive prevalence rate is 72% and the unmet need for family planning is 7.5%. Almost three quarters of births take place in health facilities (56% in rural areas), and of these 63% are in the public sector.[11]

The maternal mortality ratio is estimated at 100 per 100,000 births (2008), which is comparable with the levels in Honduras (110) and Guatemala (110).[12] Although not considered to be a 'high-risk' country in terms of maternal mortality, Nicaragua is facing other challenges with regard to sexual and reproductive health and rights, including a high adolescent fertility rate (one out of every four teenage girls is pregnant or gives birth before the age of 20), early age of sexual debut (14% of women aged between 15 and 24 had their

4 UNDP 2011. 46.2% live below the poverty line and 15.8% live on less than US$1.25 a day.
5 UNDP 2011. The same source indicates that Nicaragua occupies the 129th place out 187 countries in the human development index.
6 The gender inequality index is 0.506 (UNDP 2011).
7 UNDP 2011.
8 UNDP 2011.
9 PAHO undated a.
10 WHO 2010a.
11 INIDE/MINSA 2008.
12 UNDP 2011.

sexual debut before the age of 14),[13] high mortality from cervical cancer and a high incidence of gender-based violence.

In general, the prevalence of HIV in Nicaragua is relatively low. For 2009, it is estimated that the prevalence of HIV among adults (ages 15-49) was 0.2 per cent, and that there were 6,900 people living with AIDS.[14] Nevertheless, according to UNAIDS figures the prevalence rate and the number of people living with HIV have been constantly increasing since the mid-1990s.[15] There is also a trend towards feminisation of the HIV epidemic. Data from the latest Demographic and Health Survey (ENDESA 2006–2007) show that the level of knowledge about sexually transmitted infections (STI) is relatively low (only 28% of women have heard of chlamydia) and varies significantly with educational level and geographical location. Condom use is low (7%).[16]

Persistent problems include the discrimination that exists against persons with different sexual orientations, ***machismo*** and gender inequality. According to the survey, there is extensive gender-based violence in Nicaragua, especially against teenagers and young people. At least 20% of women have been victims of physical abuse.[17]

Annex A (CD-ROM) summarises the key demographic, socio-economic and health indicators at the national level.

Structure of the health sector

The public sector is the most important provider of primary health care and hospital services, the main actor being the Ministry of Health (MINSA). In 2004 this sector covered approximately 60% of the population,[18] although coverage may have increased in recent years as a result of policy changes. Around 8% of the population has access to social security coverage[19] (Nicaraguan Social Security Institute, INSS), with a low percentage of people using private health insurance and the remainder using private-sector health services of other kinds.

MINSA is the sector's key governing authority, and is responsible for policy development, human resources planning, medical and regulatory protocols, epidemiological surveillance and provision of essential drugs. The SILAIS (local comprehensive health care systems) are responsible for decentralised governance and in charge of providing services at the departmental, municipal and health facility levels. There are some supply-side problems in the public sector, including shortage of personnel, infrastructure, equipment and commodities, leading to limited service quality especially outside the main urban areas.

13 INIDE/MINSA 2008.
14 UNAIDS 2010.
15 UNAIDS, undated.
16 INIDE/MINSA 2008.
17 INIDE/MINSA 2008.
18 PAHO 2009.
19 PAHO 2009.

Under the new health policy introduced in 2008, basic public services and drugs are free of charge, but nevertheless shortage of the latter means that clients still have to make considerable expenditures in order to obtain them.

Overall health expenditure per capita is US$103 a year,[20] of which 56% is public-sector expenditure. The greater part of the remainder consists of private expenditures,[21] consisting almost entirely of client's out-of-pocket expenditures (an important indicator of inequality in access to health services).

Policy context

The Nicaraguan government's policies have established different levels of priority in relation to sexual and reproductive health (SRH) in recent decades. In terms of progress, since the end of the 1980s civil society has been active in promoting a rights-based approach[22] to SRH and has been instrumental in securing changes in policies and in some cases in practices. Impetus was given to this approach by the importance of SRH in the Millennium Development Goals and poverty reduction policies, and by opening up the debate on previously taboo topics as a result of the threat of the HIV epidemic. Although draft strategies for SRH existed in the 1990s, it was not until 2006 that MINSA formalised a complete SRH strategy, which was expanded in 2008.[23]

Sexual and reproductive rights, on the other hand, faced a more eventful course as a result of persistent problems, for example, the low level of access to SRH services for vulnerable groups such as adolescent boys and girls. A step backwards with respect to sexual and reproductive health and rights took place in 2006, when the National Assembly repealed the article of the penal code that permitted termination of pregnancy before twenty weeks on medical grounds, thus transforming Nicaragua into one of the few countries in which abortion is illegal under any circumstances, even when the life of the mother would be endangered.

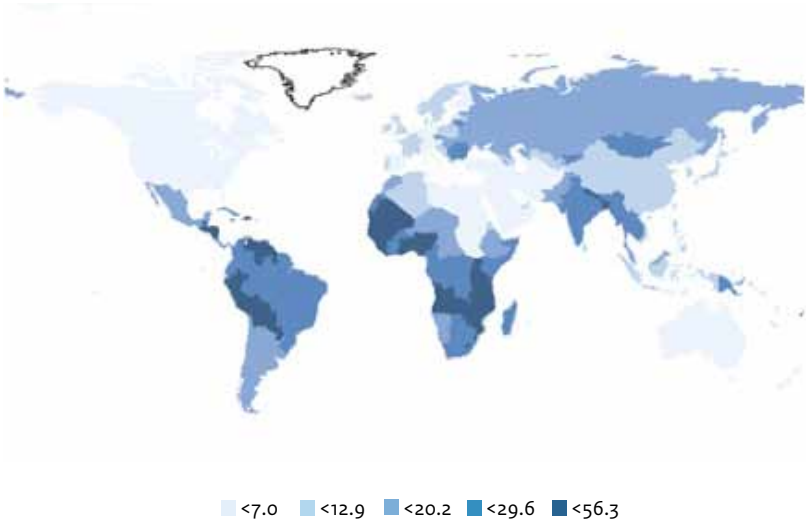
[20] MINSA 2012; data from 2009.

[21] Clients' out-of-pocket expenditures as a percentage of private expenditures on health care: 92% (in 2008) (WHO 2010).

[22] For a brief discussion of the 'rights-based approach', see chapter 3.

[23] The 2008 strategy was in fact an edited version of the 2006 strategy; see MINSA 2008a.

Figure 2.1 *Incidence of cervical cancer, 2008 (estimated age-standardised rate, per 100,000 women)*



Source: USAID/Global Health eLearning Center undated (based on Globocan 2008)

Situation with regard to cervical cancer

Overall situation

Cervical cancer (or cancer of the cervix) is the third most common cause of cancer in women worldwide (after breast cancer and colorectal cancer), with 530,000 cases and 275,000 deaths in 2008. It is the main cause of cancer-related deaths among women in various regions of the world, including Central America.[24]

The incidence of the disease varies widely among countries, although the majority of cases occur in low- and middle-income countries (86%).[25] In Central America, the age-standardised incidence is 22 per 100,000 women, similar to that for Latin America and the Caribbean (24 per 100,000). For the age group 45-53 years this is 53 per 100,000 in Central America.[26] Most of these are women from low socio-economic status who have difficulty accessing the different SRH services. Cervical cancer thus is one of the diseases that affect many sexually active women of reproductive age.

[24] IARC/WHO 2008.
[25] WHO/ICO undated.
[26] WHO/ICO undated.

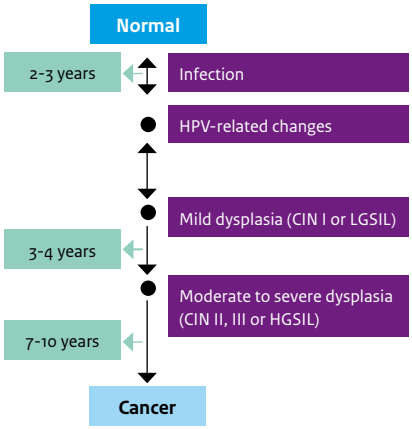
If current trends continue, due to the growing population and gains in life expectancy the number of deaths from cervical cancer in the Americas is projected to nearly double by 2030; the vast majority of these occurring in Latin America and the Caribbean.[27]

Aetiology

The human papilloma virus (also known as HPV) is the most common sexually transmitted infection (STI). Persistent high-risk HPV infections are the main cause of cervical cancer. Oncogenic types 16 and 18 of HPV are responsible for some 71% of all invasive cancers diagnosed in the Americas. HPV infection is a necessary but not sufficient precursor of cancer.[28]

All women run the risk of cancer of the cervix, and at least half of sexually active persons will contract HPV at some point in their lives, but few women will contract cervical cancer. Most infections disappear of their own accord, but a small percentage progresses, causing different types of dysplasias or invasive carcinomas.[29,30] HPV does not generally cause symptoms, and the infection generally disappears without treatment (approximately 60% of cases),[31] sometimes after a few years.[32] The prevalence of HPV varies among different regions, customarily attaining its highest point (about 20%) among women between 20 and 24 years of age and then decreasing until it reaches approximately 8% to 10% in women over 30 years of age.[33]

Figure 2.2 *Natural progression of cervical cancer*



Source: USAID/Global Health eLearning Center, undated

27 PAHO 2012.
28 MINSA 2006.
29 Dunne et al. 2007.
30 Franco et al. 1999.
31 USAID/Global Health eLearning Center, undated.
32 CDC 2012.
33 MINSA 2006.

A series of risk factors have been identified which to a large extent are associated with the sexual behaviour of both men and women. While women's sexual behaviour is relevant as a risk factor, her partner's behaviour also needs to be borne in mind. If the man has multiple sexual partners or has a background of having had a partner with cervical cancer, the sexual relation is regarded as entailing risk.

Some of the co-factors influencing the risk of appearance of the disease are smoking, immune suppression (particularly when it is HIV-related), other STIs and malnutrition. Women living with HIV contract the high-risk types of HPV more easily and have a greater probability of presenting pre-cancerous (and more rapidly appearing) lesions than HIV sero-negative women in the same age group. Other factors involved are low socio-economic status, early age of the sexual debut, multiple sex partners, pregnancies at an early age, multi-parity and use of hormonal contraceptives.[34]

The disease has a long evolution, and thus offers many opportunities for intervention in the course of the woman's life, employing effective primary and secondary prevention strategies together with appropriate diagnostic and therapeutic treatment of cases. Figure 2.2 shows the natural course of the disease.

Prevention and treatment options

Cervical cancer is the easiest female cancer to prevent by means of periodic screening and follow-up of the test results. In high-income countries, a major reduction in incidence of and mortality from cervical cancer has been apparent as a result of awareness campaigns and screening programmes. High-level lesions can generally be detected up to 10 years before they turn into cancer. Detection of precursor and pre-invasive lesions offers the possibility of successful treatment at lower cost, both socially and for the health services.[35]

WHO in 2002 recommended that countries establish priority target groups for cervical cancer screening in terms of age, based on the national epidemiology for age-related incidence of invasive cervical cancer. Usually the priority group is found to be women aged 35-54. Adequate initial coverage of this group with quality services was seen as more effective than repeated screening. Once an 80% coverage of one-time screening of the initial priority age group is reached, screening frequency is recommended to be increased to ten-yearly and then five-yearly, the latter expanding to women aged 30-60 years.[36] A few years later this approach was largely maintained in the WHO guide for health care providers, which recommends to prioritise women 30 years and over; and to increase screening frequency to three-year intervals if resources permit. Annual screening is not recommended for any age.[37]

34 Pelcastre-Villafuerte et al. 2007.
35 MINSA 2006.
36 WHO 2002.
37 WHO 2006.

Tests

Screening tests exist that can help prevent or detect cancer of the cervix in the initial stages. The Papanicolaou test (or cervical cytology, Pap smear) identifies pre-cancers, changes in the cells of the cervix which can become cancer if they are not correctly treated. The HPV test identifies the virus which can cause cellular changes of this kind.[38] Table 2.1 shows the difference between Pap smear and HPV test.

Apart from these tests, use is made of visual inspection with acetic acid (VIA), a promising new method which is especially useful in environments with scarce resources. This method involves vaginal exploration with a speculum in the course of which the health worker applies acetic acid to the cervix in order to observe changes in colour indicative of possible pre-cancerous lesions or cancer.[39] If the results of the Pap smear reveal alterations in the cervix, a biopsy is conducted, without or without colposcopy.[40]

All of the screening methods have their strengths and limitations, and a balance is generally sought between sensitivity and specificity.[41] Table 2.2 gives a comparison of the various screening methods in terms of these characteristics.

Visual inspection with acetic acid is the only form of screening that meets all the requirements. It is a simple, easy-to-understand method and is minimally infrastructure-dependent. The initial and maintenance costs are low and it can be performed by a wide range of healthcare personnel.[42]

Table 2.1 The Papanicolaou, HPV and VIA tests

	Results	How it works
Papanicolaou test	Abnormal celular alterations	A laboratory technician examines the cervical cell sample through a microscope.
Human papilloma virus (HPV) test	The virus which causes the alterations in abnormal cells	A computerised system checks a sample of cervical cells to look for the virus.
Visual inspection with acetic acid (VIA)	Possible pre-cancerous lesions or cancer	A vaginal exploration using a speculum in the course of which the health worker applies acetic acid to the cervix in order to observe changes in colour indicative of possible pre-cancerous lesions or cancer.

Source: Drawn up by the authors based on Planned Parenthood (undated).

38 CDC 2012.
39 ACCP 2001.
40 For certain terms, see the glossary.
41 Sensitivity is the proportion of all persons with the disease whom the test correctly identifies as positive. Specificity is the proportion of all persons without the disease whom the test correctly identifies as negative.
42 ACCP 2001.

Vaccine

The vaccine against HPV does not offer 100% protection against cervical cancer, but it is regarded as 99.9% effective in protecting against HPV subtypes 16 and 18, which are related to 70% of all cervical cancer. Currently, there are various studies of the acceptance of the HPV vaccine.[43] In addition to the costs a vaccination programme against HPV entails, there are other factors to be borne in mind, such as political will and the cultural acceptability of conducting this programme of vaccination against an STI among the adolescent population, ease of access to the target population and the capacity of the system to provide secondary prevention.[44]

Table 2.2 Screening comparison

	VIA	Conventional cytology (PAP)	Liquid-based cytology	HPV test
Safe	Yes	Yes	Yes	Yes
Accurate	Yes	Yes	Yes	Yes
Actionable	Yes	No	No	No
Affordable	Yes	No	No	No
Accessible	Yes	No	No	Yes/No
Practical	Yes	No	No	No

Source: USAID/Global Health eLearning Center, undated. (Accurate: acceptable balance between sensitivity and specificity)

Treatment

The treatment options depend on the stage of the disease. The methods of treating ***in situ carcinoma***, the earliest stage of cancer,[45] include cryotherapy, laser surgery, the Loop Electrosurgical Excision Procedure (LEEP) and cold knife conisation. In the case of ***in situ adenocarcinoma*** (a more advanced form), hysterectomy is normally recommended, or (for women who want to have children) cone biopsy.[46]

Jhpiego has developed a 'single-visit approach' in which VIA is combined with cryotherapy, offering at the same time, in the course of a single visit, effective screening and treatment. Using simple vinegar, cotton swabs and good lighting, which are the essentials of the VIA test, is as effective as the Papanicolaou test in detecting pre-cancerous cell changes. After a positive result, the woman can be given cryotherapy the same day. The main advantages of the single visit approach are that it requires little in the way of resources, sophisticated technology is not needed and it provides immediate results.

43 For example, the studies of acceptability of the HPV vaccine conducted by PATH, see www.path.org/projects/cervical_cancer_vaccine/phpacceptability. Other studies include the programme for the introduction of the 'screening and treatment' approach in Thailand and the Philippines by Jhpiego (see http://www.jhpiego.org/en/content/thailand).

44 USAID/Global Health eLearning Center, undated.

45 Intraepithelial cervical dysplasia or neoplasia (NIC); see glossary.

46 USAID/Global Health eLearning Centre, undated.

Combining the VIA test with low-cost outpatient treatment – which nurses can easily provide – places such cost-effective programmes for preventing and treating cervical cancer within the reach of even the poorest countries. There is growing interest in this public health approach to a clinical problem in countries throughout the world.[47] The single-visit approach has been backed by gynaecological and obstetrical associations in the United States, Canada and the United Kingdom, specifically because of its safety, acceptability and cost-effectiveness.[48]

Forms of behaviour that limit prevention[49]

In addition to the indicators relating to risk factors, there are other causes and cultural reasons that limit a preventative attitude. Among these factors are fear that the examination will be painful or that, if the patient has cancer, it will be incurable; indecision because the risk is not perceived; belief that while the patient feels well there is no problem; belief that only 'other' women whose sexual behaviour places them at risk can contract the disease.[50]

Similarly, various factors can be pointed to that affect the rate of participation in cervical cancer prevention programmes. From the client's standpoint, the decisive ones are those factors that arise from socio-cultural norms and affect women's views on SRH. According to a study conducted by the Pan-American Health Organization (PAHO)[51] on the beliefs and attitudes regarding the concept of prevention, some people seek medical care only as a last resort when household and traditional remedies fail; it is believed that all types of cancer affecting women's reproductive organs are the same and it is not known that they can be prevented or cured; others have little or no knowledge of anatomy and of their body.

Other such factors are the belief that the Pap smear is related to diagnosing STIs and the negative image of cancer and the gynaecological health services. Moreover, limitations in the supply of services, the quality of care and conceptual and structural barriers in the health system are also factors that limit access to a Pap smear.

On the other hand, factors associated with having the Pap smear done are: a relatively high socio-economic status; knowing other women who have had a Pap smear; seeking health services in the case of illness; and satisfaction with the provision of services. Similarly, among women who have had the Pap smear, the approval and support of their partner and participation in information sessions were decisive factors.

From the standpoint of the health service provider, the factors are related to the clinical requirements and the type of service offered, existing capacity to offer good service and the system by means of which women are invited to participate.

47 Jhpiego, undated.
48 USAID/Global Health eLearning Centre, undated.
49 Compiled on the basis of PAHO 2004, Pelcastre-Villafuerte et al. 2007, Goldie 2006.
50 MINSA/Ixchén 2005.
51 PAHO 2004.

Situation in Nicaragua

Indicators

Among its 5.9 million inhabitants, Nicaragua has a population of 1.74 million women aged fifteen and over who are at risk of developing cervical cancer. Cervical cancer constitutes a serious public health problem: the incidence of cervical cancer in Nicaragua in 2008 was 40 cases per 100,000 women, making it the highest incidence in Central America.[52]

In fact, the age-specific cervical cancer mortality rate in Nicargua nearly doubles that of the Central American average.[53] Nicaraguan data from 2008 show an absolute number of 869 women diagnosed with cervical cancer and 414 deaths.[54] Cervical cancer ranks as the first cause of cancer-related deaths among women in Nicaragua in 2008,[55] while over the period 2008-2010 it was also the leading cause of all deaths among women aged 15-49 years.[56] Table 2.3 summarises the significance of cervical cancer in the local and regional context. Nationwide, the estimated mortality rate from cervical cancer rose from 11.7 per 100,000 women in 1998 to 16.3 per 100,000 women in 2009; over the period 2005–2009, 1,151 women died from this cause in Nicaragua.[57]

Table 2.3 Cervical cancer indicators in context: Nicaragua and Central America

	Nicaragua		Central America
Cervical cancer incidence (2008) (1)	Total 869 cases	Rate 40/100,000 women	Rate 22/100,000 women
Cervical cancer mortality (2008) (1)	Total 414 cases	Rate 21/100,000 women	Rate 11/100,000 women
Comparison: Maternal mortality (2008) (2)		100/100,000 live births	Hon: 110/100,000 lb Gua: 110,000 lb
Top-3 Cancers among women 15-49 years (2008-2010) (1)	Incidence 1. Cervical cancer 2. Breast cancer 3. Thyroid cancer	Mortality 1. Cervical cancer 2. Thyroid cancer 3. Breast cancer	
Top-5 Mortality, all causes, among women 15-49 years (2008-2010) (3)	1. Cervical cancer 2. Intentially self-inflicted injuries and suicides 3. Diabetes 4. Maternal causes 5 Urinary tract infections		1. Homicide 2. Cervical cancer 3. Diabetes 4. Urinary tract infections 5. Maternal causes

Sources: (1) WHO/ICO 2010; (2) UNDP 2011; (3) PAHO undated b.

52 WHO/ICO 2010; data 2008.
53 WHO/ICO 2010; data 2008.
54 WHO/ICO 2010; data 2008.
55 WHO/ICO 2010; data 2008.
56 PAHO undated b.
57 Alvarado and Martínez Granera 2010.

Intervention strategies

Interventions to reduce morbidity and mortality from cervical cancer are relatively recent. Most of them have been conducted in the past 10 years based on the Papanicolaou test.[58] An inventory of actors and programmes in the area of sexual and reproductive health– including prevention, screening and treatment of cervical cancer– appears in annex C (CD-ROM).

Between 2005 and 2009, 2,223 new cases (women with positive Pap smears) were diagnosed. The ages of women more frequently affected by invasive cancer range between ages 31 and 45 (56%). It is significant that intervention programmes have not achieved the expected impact in terms of coverage: 52% of all cervical cancer cases treated in the Bertha Calderón National Reference Hospital for Women were not preceded by a Pap smear.[59]

Significantly, in 2008 the Surveillance System for Gynaecological Cancer Prevention (SIVIPCAN) won the American Cancer Society's best practice award for Latin America for that year. Nicaragua was one of the first countries in Latin America with a surveillance system for the registration, case follow-up and prevention of cervical cancer. MINSA also launched RedCan4 (register of tumours at the hospital level).

With the support of UNFPA and other organisations, MINSA provided basic equipment for the installation of 13 early lesion treatment clinics in departmental hospitals in 2009. The Ministry also took the initiative of holding national Pap smear days, with Ixchen participating in analysis of the samples (2010–2011).

Policies and norms

Despite the action taken, cervical cancer in Nicaragua constitutes a public health problem which only has begun to be the subject of true follow-up and a surveillance system since 2008.

The activities mentioned above are based on the policies under the health model, the political and conceptual foundations of which can be identified in the relaunching of the already-familiar primary health care strategy. This model, known as the Model for Family and Community Health (MOSAFC), is aimed at strengthening approaches to health promotion and disease prevention at the community level, reducing emphasis on the traditional curative approach.

At that time, MINSA determined that the populations of rural areas and those which in general had greater problems of access to health services should be regarded as priorities when implementing intersectoral activities for cervical cancer prevention.[60]

58 Alvarado and Martínez Granera 2010.
59 Alvarado and Martínez Granera 2010.
60 MINSA 2006.

It is here that the National Alliance for Cervical Cancer Prevention, made up of the Ministry of Health, NGOs and other actors, makes its presence felt.[61] One of the Alliance's objectives is to reduce mortality from cervical cancer in priority geographical areas by means of Pap smear screening. In addition, its strategic guidelines include updating the national standard for the prevention, screening and care of cervical cancer and initiating a training plan at the national level to disseminate it.

In 2006, MINSA approved the Technical Standard for Cervical Cancer Prevention, Detection and Care[62] and the National Committee for Cancer Prevention and Control was established. Its function is to advise and coordinate the planning and implementation of activities for the prevention, early diagnosis, timely treatment and palliative care of cancer. It establishes as target groups women aged 21-65, women below 21 years with a "clinical history of risk", women over 65 years with no recent Pap smear and all pregnant women. In terms of screening frequency, the document establishes a standard in which Pap smears should be done annually for three years in a row, after which the screening would continue with three-year intervals.[63]

In April 2010, the Protocol on Prevention of Cervical Cancer by screening using VIA and cryotherapy treatment was approved.[64] The Protocol was drawn up for use by health professionals on women in communities where access to health care is difficult. It establishes as target group women aged 30-50, with special emphasis on those who never had a Pap smear and those whose last Pap was over three years ago.

The National Committee also bore responsibility for drawing up and implementing the National Strategic Plan for Cancer Prevention and Control, which was drawn up and agreed upon with universities, the INSS, cancer patients' associations, medical associations and other civil society organisations such as Ixchen, Sí Mujer, the Nicaraguan Communal Movement and the Central American Institute of Health.[65]

In August 2008, MINSA drew up the manual for health promoters, 'Preparing to combat cervical cancer', with a view to undertaking prevention and early detection activities for cervical, uterine and breast cancer.

61 The Alliance is made up of MINSA, Ixchen, Profamilia, SONIGOB, the Medical Faculty of UNAN-Managua, Si Mujer, nursing schools, the María Luisa Ortiz Association, CEPS, ICAS, AMCA, the Ortiz Guardián Foundation, AMA and multilateral development aid agencies such as PAHO, UNFPA and bilateral cooperation bodies such as the Embassy of the Kingdom of the Netherlands.

62 MINSA 2006. This document served as the basis for training session conducted by Ixchen as part of the activities under the sectoral programme.

63 MINSA 2006.

64 MINSA 2010b

65 MINSA 2008d.

Alongside the advances in terms of policies and standards, at the operational level health facilities of the Ministry face certain limitations in responding more effectively and with less dependence on the national reference units, such as insufficient availability of equipment and qualified human resources in the various SILAIS. In response, MINSA is putting into effect certain measures to strengthen preventive and curative action, accompanied by improvements in the information system. In addition, in 2010–2011, the Ministry conducted national Pap smear days with Ixchen participating in analysis of the samples.

3

Ixchen cervical cancer mobile team vehicle, 2010, Esther Jurgens/ETC Crystal

Description of the intervention

The sectoral programme for the prevention and treatment of cervical cancer was developed by the National Alliance for the Prevention of Cervical Cancer mentioned above. The design of the activity was part of the Alliance's response to the high rate of cervical cancer in Nicaragua through activities with the public sector and civil society. Dutch support included funds for the component executed by MINSA, and direct financing for the Sectoral Programme to be implemented by the Ixchen Women's Centre, a Nicaraguan organisation which has been working for women's health since 1989, in collaboration with MINSA. The programme was carried out between 2005 and 2009. A second phase of the programme is currently under way during which Ixchen is working together with other NGOs. Table 3.1 summarises the characteristics of the programme.

Table 3.1 Key characteristics of the Ixchen programme (2005–2008)

Name of the programme	Sectoral cervical cancer programme
Implementation period	2005–2009
Financial support (US$)	2.4 million
Main characteristics	Prevention of cervical cancer directed towards a major health problem with a human rights-based approach
Target population	Women aged 15 and over

Sources: Alliance 2005; Embassy of the Kingdom of the Netherlands, 2005.

Objectives

The overall aim of the activity was:
To contribute to improving the sexual and reproductive health of women aged 20–64 through a strategic alliance for detection and early treatment of cervical cancer and sexually transmitted infections, working within a framework of comprehensive care for women.

The general objective was:
To increase the survival rate of adult and older women through early detection and treatment of cervical cancer and STIs in 75 municipalities.

The specific objectives were:

a. To improve the knowledge and attitudes of women and men regarding the need to prevent cervical cancer;
b. To progressively increase the coverage of cervical cancer screening (Pap smears) among women aged 20–64;
c. To ensure opportune diagnosis and treatment of early-stage lesions and STIs detected among service clients;
d. To guarantee palliative treatment for women diagnosed with invasive cancer;
e. To strengthen the institutional capacities of the Ministry of Health and civil society organisations to work within a sectoral approach for the prevention of cervical cancer, through the development of a demonstration project on comprehensive care for women.

Target groups

The programme focused on low-income women. Although the work assigned priority to rural areas of 75 municipalities in which MINSA had insufficient coverage to detect cervical cancer and limited capacity to detect and treat STIs, the programme also operated in urban centres where services were requested for under-served groups by MINSA or the local authorities. The principal target group was low-income women, but in practice coverage extended to all women who arrived at the mobile units seeking health services. Services were also provided to women outside the 20 to 64 age range; in the end, all women aged 15 and over were accepted for cervical cancer testing.

Approach and strategies

The programme operated using a rights-based approach,[66] with emphasis on ensuring (through education and extension work) that women are aware of the importance of their SRH and their right to demand a good human and technical quality of the related services. The intervention's operational strategy was based on the use of mobile units to provide services in areas where MINSA services were not available or were inaccessible because of geographical distance or other reasons. The work of the mobile teams included a service provision element and an educational element, the latter being addressed to making women aware of SRH.

The Ixchen mobile teams were to work in coordination with the static services of MINSA. In areas where MINSA had no nearby health facilities, its staff would accompany the mobile units in order to provide a broader range of services such as mother and child health services (pre-natal and post-natal care, infant health and growth monitoring), while the Ixchen personnel in the mobile units would provide gynaecological consultations, detection and syndromic management of STIs and Pap smears/cytologies for detecting cervical cancer.

Ixchen was to establish six mobile teams of medical and educational personnel to conduct a programme of community visits in the municipalities covered by the programme. Work would be carried out in coordination with the local authorities to activate community networks of health workers and community agents in their areas, who would inform women of the services provided by the mobile units and promote the use of the services. The results of the Papanicolaou cytology testing conducted during the mobile unit's visits were to be made available to the women at subsequent visits. The training foreseen for the MINSA personnel and community agents was intended to enable the projects to leave the community networks and public health facilities strengthened, with greater capacity to carry out future screening and referral programmes.

[66] The rights-based approach in the area of development may be described as a set of principles based on recognition that development is multidimensional and linked not only to economic poverty but also to aspects of vulnerability, insecurity and inability to make themselves heard (lack of a voice). Rights-based development programmes seek inter alia: (i) to empower people (rights holders) to make themselves heard, influence decisions affecting their lives and exercise their rights; and (ii) to strengthen governmental and non-state organisations (duty-bearers) so that they can carry out their responsibilities (ODI 2003, KIT undated).

The women attending the mobile units who had Pap cytologies conducted, as well as those who attended the static MINSA units and were referred to Ixchen for analysis of the tests, were to be informed of the results within approximately one month.

All women identified as having positive cytologies[67] were to be referred to early lesion treatment clinics related to cervical cancer in the closest cities, being existing clinics of the Ixchen and Profamilia service network.[68] All the women referred to these clinics were to have a colposcopy and biopsy conducted to confirm the diagnosis. Those with conditions that could be treated in the clinics would continue to use these services; women with advance lesions would be referred to the regional or national hospitals of MINSA for appropriate treatment in accordance with their diagnosis.

While syndromic treatment for STIs was envisaged, there were difficulties in providing the drugs. This may have had an effect on the overall impact of the programme, but this component was not eligible for inclusion in the study for methodological reasons.

[67] It is important to point out that in equivalent static programmes, many women would simply have been monitored by repeating the test. The generous treatment protocol applied under the programme was owing to the difficulty of carrying out, monitoring and regular follow-up detections among the target groups, particularly those living in remote areas without access to regular services.

[68] Profamilia is a centre affiliated with the International Planned Parenthood Federation (IPPF).

Ixchen poster on their cervical cancer services, 2011, Hermen Ormel/KIT

4 Objectives, methodology and limitations

The impact assessment seeks to provide information on the expected and unexpected results of the sectoral programme for the prevention and treatment of cervical cancer conducted by Ixchen in cooperation with MINSA. For the study, the causal chain representing the programme's intervention logic was constructed (fig. 4.1). The chain stretches from improved or increased awareness in the number of women undergoing a Pap smear to the number of women showing positive results who received treatment and were cured. This was taken into account both in designing the methodology and tools for compiling information and in conducting the methodological selection for the analysis and identifying the impact route of the intervention itself.

Study objectives and questions asked

The overall objective of the study was to evaluate the impact of the sectoral cervical cancer prevention and care programme carried out by Ixchen together with MINSA over the period 2005–2008. For the research questions posed, see textbox 4.1.

Textbox 4.1 *Specific research questions*

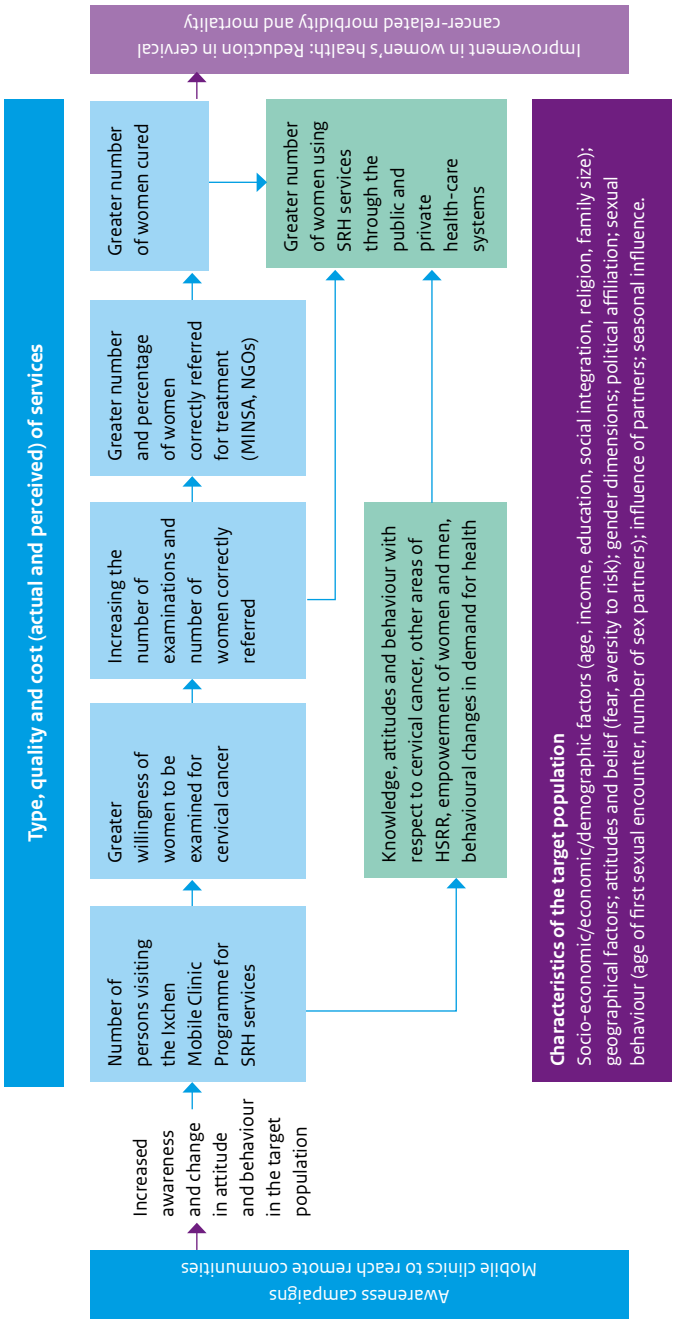
1. Detection of cervical cancer:
   a) What is the net effect of the intervention in terms of coverage (number of people screened for cervical cancer) compared to the without-intervention situation?
   b) What are the main factors that explain the scope of the intervention?
2. What is the effect of the intervention in terms of knowledge of and attitudes to cervical cancer and other SRH issues?
3. What is the effect of the intervention on the target group's use of other SRH services offered by the public, private and NGO sectors?
4. Treatment of clients for cervical cancer:
   a) What is the net effect of the intervention in terms of number of people correctly treated (discharged) for cervical cancer compared to the without-intervention situation?
   b) What are the main factors that explain (start and continuation of) treatment and drop-out ratios?
5. How effective has the intervention been in terms of formation and sustenance of public-private partnership?
6. How cost-effective has the intervention been in terms of cost per screening and cost per case detected?
7. What are some of the most important unexpected effects of the intervention?

Methodology

To answer these questions, the study used a rigorous evaluation design involving counterfactual analysis,[69] combining both quantitative and qualitative research methods. A summary of the methodology used is given below. Annexes D and E (CD-ROM) provide details of the methodology, in general and specifically for the quantitative, qualitative and cost-effectiveness components.

[69] Counterfactual analysis compares the situation of what happened because of the intervention with the situation that would have happened without it; this involves building a 'counterfactual' situation in order to be able to compare it with the 'factual' situation.

Figure 4.1 *Chain of causation*



Quantitative study

Part of the quantitative study was based on a counterfactual approach to establish a plausible estimate of the situation without intervention and a subsequent estimate of the net effect of the Ixchen programme in terms of number of women examined to detect cervical cancer on the basis of a comparison of the examination rates during prior and subsequent screenings.[70] The same approach was applied to estimating the net effect of the intervention in terms of number of women correctly treated in comparison with the scenario without the programme. To be able to answer a large part of the other research questions asked in the impact assessment – explanation of net effects, estimated increase in awareness of SRHR, factors influencing treatment or drop-out rates and unexpected results – a survey was developed and applied to a random[71] sample of 634 clients of the programme implemented by Ixchen (see annex 2 for details of the calculation of the sample and other methodological details).

The statistical power of the sample is high compared with the target population of the programme carried out by Ixchen, in that a larger sample was taken than that calculated using the sample, though representative, random sampling formula. Nevertheless, the statistical power in relation to the national population is low, because the sample was selected only in municipalities where the programme was operating, and these were selected by Ixchen not on a random basis but for specific purposes.

Qualitative study

The qualitative data on these last questions were supplemented by information compiled using qualitative tools, that is to say five case studies and 79 semi-structured interviews: 21 clients, 11 non-clients, 13 members of clients' families, 24 members of the Ixchen medical and management staff of Ixchen, Profamilia and MINSA; and 10 key informants. The interviews also helped shed light on the question regarding the effectiveness of the intervention in terms of treating and sustaining public-private cooperation.

Cost-effectiveness study

The cost-effectiveness analysis established the outcome of the programme with respect to what has been achieved with the resources utilised to date, in terms of cost per Pap smear conducted, cost per case detected and cost per case treated, and in addition the cost per life saved. This may be compared with the results of other approaches to screening, such as that taken by MINSA's static clinics (for more details, see annex 4).

Comments and limitations of the study

There are various foreseen and unforeseen circumstances that have to be taken into account in analysing the results, conclusions and recommendations of the present study.

[70] Given the specific scope of Ixchen, with disadvantaged groups in non-randomly selected communities, it would be fairly difficult and expensive to conduct a counterfactual comparison between participating and control groups, although this would offer more explanatory power.

[71] Representative sample – cross-section with recall.

Openness of the participants In conducting the survey, one of the main limitations that always has to be borne in mind was the 'openness' of the women to providing personal information in a survey, especially on such sensitive issues as cancer and STI. An attempt was made to approach it by obtaining prior consent to participate with the support of Ixchen personnel (before requesting informed consent) and by giving the staff conducting the survey appropriate training. Even so, about 125 women who were selected refused to participate in the interview or claimed not to remember participating in the programme, a high figure considering the difficulty of forgetting such an invasive examination. Nevertheless, there are no grounds for suggesting the existence of substantive differences between the women who participated and those who decided not to participate in the study, above all with regard to geographical and socio-economic aspects, since other women close to the non-participating households and with similar characteristics decided to do so. In other words, all the participating women had the same possibility of being selected, and it depended above all on their decision.

Recall bias This bias is a risk in surveys and interviews that ask about the past, all the more so when the past in question is more remote. Respondents may not remember the past, or remember it only in part or with errors as to exactly what happened and as to their opinions and feelings at the time. In addition (i) memories of events which at the time appeared (or now appear) important are customarily recalled more vividly than events which appeared (or now appear) less important; (ii) subsequent related incidents may 'reinforce' the memory of earlier incidents.[72]

Incomplete database To produce the sample for the survey of Ixchen clients, it was hoped to conduct random sampling, since this has greater statistical power. However, it was impossible to conduct this simple random sampling as a result of serious limitations in Ixchen's database (see annex 2 for more details). It was then decided to use cluster sampling. Given that this has less statistical power, the sample size was increased in order to achieve a level of precision similar to that of simple random sampling. The sample obtained is still representative of the population of clients of the Ixchen programme; for example, the average age of clients surveyed on the date of the first Pap smear coincides with the average age of the programme's clients in the sample taken from Ixchen's books.

Because of its characteristics, the qualitative study is not and does not claim to be representative; nevertheless, the interviews and cases contribute to a broad variation of situations and characteristics of the population investigated.

Lack of access to files In the qualitative case studies, it had been hoped to include also the perspective of the service providers. This proved impossible because no way could be found of establishing a relationship between the files available in Ixchen and those available in

[72] Evidence on the effect of recall bias on data quality is limited and context-related. Coughlin's early study (1990) suggests that recall bias is related to the characteristics of the respondents and of the variable the respondents are exposed to. Proper study design and data collection techniques should limit recall bias. For additional health research studies discussing recall bias, see Chan et al. 2012, Bui et al. 2011 (both in relation to cancer research) and Drapeau et al. 2011.

the MINSA units. In addition, Ixchen decided at some point to retain only the files on women with positive Pap smear results and not those of women with negative results.

Limited information on other aspects of SRH The results of the survey and the interviews do not offer a very in-depth perspective on the knowledge and attitudes of 'other' aspects of SRH (apart from the Pap smear and cervical cancer).

Control group Two of the questions asked in the survey were approached by means of counterfactual analysis. Normally, a comparison would be made between participating and control groups, but this was difficult to do given the specific scope of Ixchen, which targeted disadvantaged groups in communities not selected at random. In addition, no baseline survey was conducted at the time. Therefore, a more straightforward, but still reliable, counterfactual approach was taken on the basis of comparing statistics prior to the intervention with those subsequent to it (see annex I (CD-ROMJ) for more details). Another aspect worth pointing out relates to the question regarding treatment (section 5.5), where the net effect is identified in terms of (i) 'extra' women treated as a consequence of the net effect in terms of Pap smears and (ii) 'extra' life years saved. In principle, it would also be possible to approach the 'net effect' of treatment using another approach – that of differentiating between the outcomes of a treatment chain initiated in the Ixchen programme and one initiated outside Ixchen ('without-intervention'). This would require a specific counterfactual situation in order to compare the treatment chains. However, a valid counterfactual would not be so easy to construct, and moreover the present study never made provision for one.

Key aspects of impact assessments

For 'rigorous' impact assessments including a counterfactual analysis, there are certain aspects that merit special attention.

- **Confounders:** This term relates to parallel interventions that create 'confusion'. Given that in the present study no control group was constructed, but the intervention group itself was used as the control, it is important to exclude the possibility that another intervention might explain any difference found.

  In the case of the net effect on Pap smear coverage, it is estimated that a causal relationship between the intervention and the results is simple and strong, because the intervention focused on disadvantaged areas with low service utilisation in which the intervention is the strongest explanatory factor for increases in the number of people examined and treated for cervical cancer. In addition, it is known that MINSA coverage remained stable during the intervention period and so probably there were no other interventions influencing the demand for services.

  Bearing in mind that for questions 2 and 3 the design included no counterfactual analysis, it is important to take into account what other events and factors might have influenced knowledge, attitudes and use of SRH services over time since 2005. The major programmes and interventions in effect during the intervention period evaluated are summarised in annex C (CD-ROM). However, the present study does not claim to have

investigated the possible parallel influence of these programmes.

In addition it is important to recall that since 2008, Ixchen and its partners have continued with a second phase of the cervical cancer prevention and care programme. Given that the second programme covers geographical areas similar to the first programme, the effects found then may have been the result of (or have been strengthened by) the activities under the second programme.

- **Selection bias:** This would occur if certain (groups of) people were more likely than other (groups of) people to be selected for the sample. We sought to deal with this situation, including the risk of self-exclusion from (or self-selection for) the survey. There are no grounds for suggesting the existence of substantive differences between the women who participated and those who decided not to participate in the study. This is true above all with regard to geographical and socio-economic aspects, in that other women who were neighbours of those in the households which were unwilling to participate and possessed similar characteristics (average age, housing conditions and apparent economic situation) decided to do so. In other words, all the participating women had the same possibility of being selected, and it depended above all on their decision.

With regard to the subgroup of women who continued treatment in the sample for the survey, it was found that this group is fairly similar (in terms of percentage of women discharged) to that in the Ixchen database.

- **Spill-over effect:** The study cannot rule out that this effect may have influenced the result to a certain extent. This is because the intervention group was also used as the control group, and the responses with regard to knowledge, perceptions and attitudes depend on the women's memory. Even with the best intentions on the part of both the interviewee and the interviewer, it is possible that the intervention may have influenced what people remember.

5

Ixchen education session on gender issues, 2011, Hermen Ormel/KIT

Results

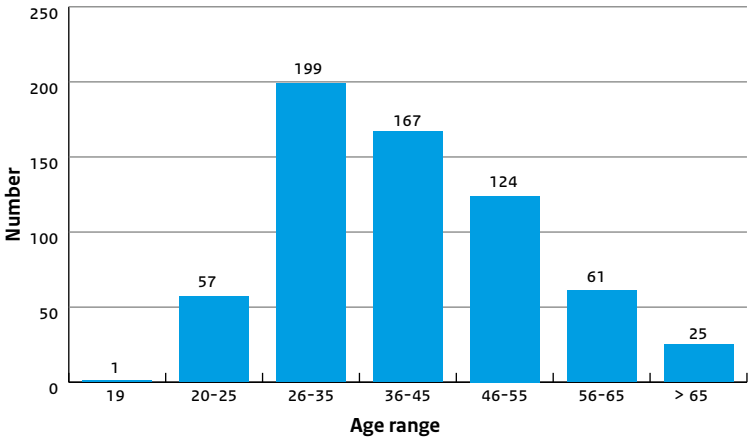
This chapter summarises the results of the three partial studies on quantitative, qualitative[73] and cost-effectiveness aspects. First, the characteristics of the participants in the quantitative and qualitative studies are presented.[74] Next, the specific research questions, as described in the previous chapter, are presented (with the exception of the last question, which will be dealt with in the chapter on discussion and conclusions).

5.1 Participants – characteristics and context

Quantitative study

The age of the 634 women surveyed ranged between 19 and 83 years of age on the date of the interview; in other words they were aged between 14 and 78 at the time of Ixchen programme's first intervention (see fig. 5.1).[75]

Figure 5.1 *Age range of women surveyed (on the date of the interview)*



Source: Prepared by the authors on the basis of the CDR–Ixchen survey (2011).

Of the women surveyed, 66% were married women with a partner living in the home, 11% had no partner living with them for work-related or family reasons and 23% were single women. About half the women surveyed had three to five children (48%), 2.5% had none and 17% had more than five children. About 22% of the women surveyed said that they were the head of household, while in about 63% of cases the head of household was the interviewee's husband or partner. In terms of schooling, at least 17% of women surveyed had not completed one year of schooling, while 35% had attended 1–5 years of primary schooling, but not completed the sixth. Nevertheless, 85% of the women surveyed said they were able to read and write. Among the women surveyed between the ages of 26 and 35,

[73] In what follows, the discussion on quantitative results will use the terms 'survey'/'women surveyed', while for the results of the qualitative study the terms 'interview'/'interviewee' will be used.

[74] Annexes F and G (CD-ROM) give the characteristics of the male and female participants in greater detail.

[75] Henceforth the 19-year-old interviewee will be included in the 20 to 25-year-old age group.

there were higher levels of completed schooling, and a greater number of women who had completed at least primary education.

Most of the women (76%) were engaged in unpaid work, the vast majority being housewives. Eight per cent of the women were traders, and 6% were private or public employees.

Among the health facilities predominantly available in the communities of the women surveyed was the health centre or health post (70%), located at an average of 2.5 km from the home of the women surveyed.

Qualitative study

In terms of education, 9% of the interviewees had no schooling, 2% were illiterate, 42% had incomplete primary, 16% incomplete secondary and 7% had graduated from secondary school or university. Of the interviewees, 76% had a partner (married or accompanied) and 22% had no partner (divorced or separated). The interviewee's average number of children was 3.3. Of the 13 family members interviewed, 46% were men; these were partners of the programme's clients.

Fifty-one per cent of the people had no paid employment (housewife, retired), while 49% did (traders, coffee pickers, housemaids, mechanics, carpenters, tobacco growers' employees, shoemakers, farmers and teachers). The monthly average wage of those in paid employment was 2,262 córdobas (US$131 at the average exchange rate for the period covered by the project).

5.2 Screening for cervical cancer: Coverage and determining factors

Question 1 What is the net effect of the intervention in terms of coverage (number of people screened for cervical cancer) compared to the without-intervention situation? What are the main factors that explain the scope of the intervention?

Coverage

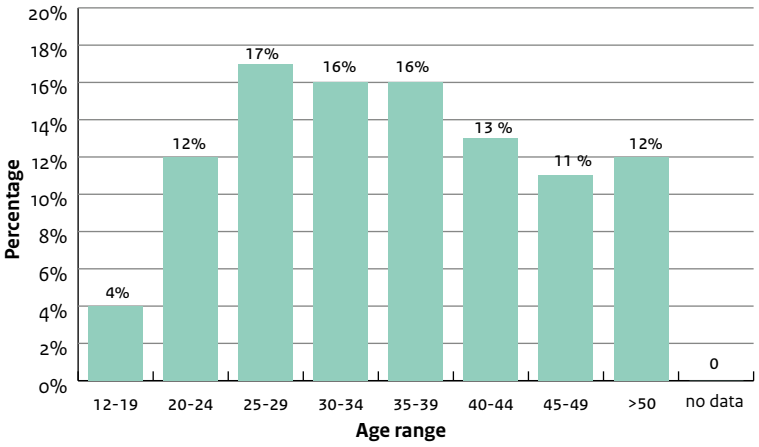
The sectoral programme implemented by Ixchen between 2006 and 2008 covered 76 of the total of 153 municipalities. The programme reported that it had provided services to 88,769 women in the mobile units, 66,512 of whom had a cervical cytology (Papanicolaou). Of these, 4,432[76] women showed a positive result.

[76] According to data from reports by the Ixchen Women's Centre in 2008, 4,611 cases of women with some lesion or cervical cancer were reported; nevertheless, in databases only the existence 4,432 cases could be verified, representing 6.6% of the total cytologies conducted. However, considering that according to the database of positive cases only 2,211 cases of women were detected by the Ixchen mobile units (the others were detected by MINSA static services and were referred to Ixchen for processing of the Pap specimen), the real percentage of cases detected is 3.3% of the total number of cytologies conducted.

Figure 5.2 shows the age range distribution of women with early or cancerous lesions treated by the programme. Although the majority of those treated were aged between 25 and 39 (50%), 36% were over 40 years of age, and 4% were less than or equal to 19.

The age-group distribution of the diagnoses obtained from the 4,432 Pap smears is presented in annex H (CD-ROM).

Figure 5.2 *Ages of women with early or cancerous lesions treated between 2006 and 2008*



Source: Data from the Ixchen Women's Centre based on 4,432 verified cases.

Net effect[77]

Annex 3 describes the methodology for the counterfactual analysis of Pap coverage. In accordance with that methodology, this section presents the estimated net effect of the Ixchen intervention on Papanicolaou coverage on (i) the scenario of the intervention, which between 2006 and 2008 conducted 66,512 cervical cytologies (Pap smears) through the programme's mobile units; and (ii) a scenario of **X** cervical cytologies that would have been conducted without the programme's intervention.

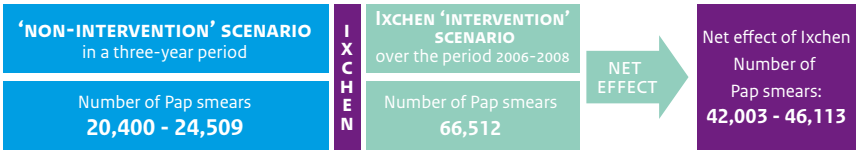
According to the calculation of 'years of reproductive age' of the women surveyed, the average index of Pap smears conducted over a three-year period for the total sample was estimated at 0.3376. Taking into account the confidence interval of 90% and extrapolating to the population attended by Ixchen, the number of Paps conducted in a three-year period in a situation without the programme's intervention is between 20,400 and 24,509.

This range represents the baseline in a non-intervention situation. Nevertheless, it is known that during the period of the Ixchen programme 66,512 Pap smears were conducted. The net

[77] Net effect: the difference between (i) the result of the without-intervention situation and (ii) the intervention situation.

effect of the Ixchen programme, then, is the difference between the real scenario and the non-intervention scenario: this net effect would be between 42,003 and 46,113 Pap smears, which represents the 'extra' number of people covered by the programme (see fig. 5.3.). Given the calculated baseline and considering the total number of women treated, the net effect of the intervention is a high increase in coverage.

Figure 5.3 *Net effect of the Ixchen intervention on Pap smear coverage*



Source: Drawn up by the authors.

Medium-term effect

In order to know how lasting the effect of Ixchen intervention was on women's awareness in terms of having a Pap smear in the medium term, an attempt was made to establish a percentage of women who had a Pap smear conducted at two junctures: before and after the Ixchen intervention. As explained in annex 2 on the methodological details, for purposes of this analysis the total sample was divided into four groups, considering that all clients had at least one Pap smear conducted by Ixchen: (1) women who had one or more Pap smears before and after Ixchen; (2) women who had a Pap smear conducted only with Ixchen; (3) women who had one or more Pap smears only before Ixchen; and (4) women who had one or more Pap smears only after Ixchen.

Table 5.1 Women aged 14-45, by Pap smear, in a period before (2003–2005) and a period (2009–2011) after the Ixchen programme

Was a Pap smear performed?	Period 2003-2005		Period 2009-2011	
	No.	%	No.	%
No	451	91.3	334	76.3
Yes	43	8.7	104	23.7
Total	**494**	**100**	**438**	**100**

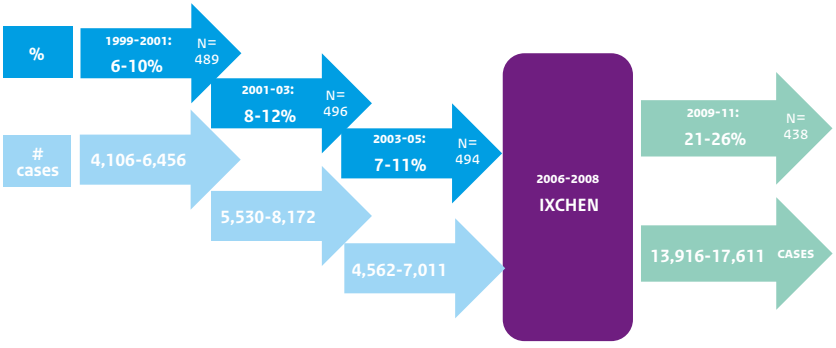
Source: Drawn up by the authors on the basis of data from the CDR-Ixchen survey (2011).

What is known for each group is what proportion of the sample it represents and the number of Pap smears performed before and/or after the Ixchen Pap. There is a need to control for the differing periods: the period before the Ixchen intervention covers many years, while the period after covers only three years. Accordingly, the number of Pap smears

for two different time periods was analysed, as explained in the methodology section: 2003–2005 and 2009–2011. The analysis does indeed show that coverage increased in the period 2009–2011, after Ixchen, in comparison with the period before Ixchen, 2003–2005. Table 5.1 shows that before the Ixchen Pap smear only 8.7% of women aged between 14 and 45 had gone for a Pap smear, while for the period 2009–2011, after the Ixchen programme, 23.7% of women in that age range had had at least one Pap smear. While there is still a majority of women in both periods who did not have a Pap smear, this increase of 15 percentage points is significant.

To ascertain that there was not something out of the 'ordinary' in the period 2003–2005 to explain this difference, the same analysis was performed for other three-year periods before the Ixchen Pap smear. Figure 5.4 shows the results of this exercise, and reports the percentage of women, out of the total of women aged between 14 and 45, who had had a Pap smear performed during the period. The percentage and total number of women in the specified age range are reported with a confidence interval of 90%.[78]

Figure 5.4 *Percentage of Pap smear coverage for different periods according to the results of the survey*



Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

It is apparent that there was greater coverage in the period 2009–2011, after the first phase of the Ixchen programme had been completed. While there are some variations depending on the three-year period selected, the percentage of women undergoing Pap smears in the last period is much higher. In other words, these data suggest that Ixchen has had an impact on demand for new Papanicolaou services after its intervention, and particularly a coverage of 13,000 to 17,000 cases.[79]

[78] In view of the earlier observation made regarding differential recall bias, the results of the survey regarding use of services, including treatment, need to be treated with caution.

[79] These cases were calculated on the basis of the total population receiving Pap smears through Ixchen (66,512) between 2006 and 2008.

Determinants of having a Pap smear before Ixchen (without-intervention scenario)

The sample for the survey includes a significant group of women who had already had a Pap smear performed before the Ixchen intervention. Nevertheless, there is also a group of women who had not had a Pap smear performed before the Ixchen intervention. What factors explain whether they had or had not had a Pap smear conducted before this intervention?

To answer this question, this section analyses in detail the results of the ***probit*** model[80] for the regression analysis, which measures the effect of a series of variable indicators on the probability of a woman having had a Pap smear before her first Pap smear at an Ixchen mobile unit. The results show some very clear effects in terms of the behaviour pattern related to demand for reproductive health services among Nicaraguan women of fertile age; the most important of these are shown in table 5.2 and described below.

Formal education Positive effect. Access to education, not just educational level, is an important explanatory factor.

Sources of income No major effect. This is perhaps logical given that the descriptive statistics had already shown the existence of a large percentage of unpaid work. Only some models suggest that women in paid employment have a higher probability than women not in paid employment, and this may be associated with the possible cost of the Pap smear, whether as payment for the service at a private clinic or as transportation costs for travel to the health centre.

Head of household status There is a positive and relatively large effect for women who are heads of household as opposed to those who are not. This may be associated with the greater responsibility of these women for the survival of the household, and consequently with greater awareness of the importance of health checks.

Distance to nearest health centre This is a negative and significant effect. It would imply that for each hour a woman is distant from a health centre where she can receive a Pap smear, the probability of her having one decreases by 12 percentage points. This shows the importance of investments in the supply of reproductive health services, such as for example the Ixchen mobile units which make the services available at a shorter distance.

Having children No effect – and this is somewhat surprising, given that there was an expectation of finding a positive relationship with pregnancies, for which in many cases contacts are established with a health service where a Pap smear can also be done or where information on the importance of doing so is available.

[80] Probit model: A type of regression analysis in which the dependent variable may assume two values (0, 1) associated with the probability of occurrence of other independent variables. See annex J (CD-ROM) for more details of this model.

Geographical location In general, when checked by department, it is apparent that in Managua access to services in general, and health services in particular, is greater, given the greater health service supply and infrastructure. Consequently, the probability increases if women in Managua are compared with women in other departments.

Awareness of family planning methods This has a key effect for the performance of a Pap smear. In all models, the effect of having some level of awareness of contraceptive methods is positively and significantly related to the probability of women having had a Pap smear conducted before the first Ixchen intervention.

Table 5.2 Probit analysis of factors that could have influenced the decision to have a Pap smear before Ixchen

Variable	Indicator	Effect	Magnitude of effect	Significance
Age	Age, years completed	↑	→	●●●
	Age squared	↓	→	●●
Education	***Education 1: A set of 4 dummies (Secondary education = base):***			
	No education	↓	→	●●
	Primary education	↓	–	–
	Tertiary education	↓	–	–
	Education 2: A set of 3 dummies (No education = base):			
	Primary education	↑	→	●●●
	Secondary education or higher	↑	→	●●●
	Education 3: A continuous variable:			
	Years of formal study	↑	→	●●●
Income sources	Dummy: In paid employment?	↑	→	+/–
	Dummy: Receiving remittances?	↑	–	–
Head of household	Dummy: Head of household?	↑	→	●/●●
Children	Dummy: Had children before the Ixchen mobile unit Pap smear?	↓	–	–
Availability of services	Time in minutes to the nearest health centre	↓	→	+/●●
	Dummy: Availability of health services (midwives)	↓	–	–

Table 5.2 Probit analysis of factors that could have influenced the decision to have a Pap smear before Ixchen

Variable	Indicator	Effect	Magnitude of effect	Significance
Partner support	Dummy: Has a partner?	↓	–	–
	Index measuring partner support	↑	–	–
Knowledge of contraception methods	Index measuring knowledge of contraceptive methods	↑	→	●●●
Membership in an organisation	Dummy: Member of any organisation?	↑	→	– / +
Area of residence	Dummy for semi-urban area (as compared to rural area)	↑	–	–
	Dummies for departments of residence (in relation to Managua)	↓	→	●●●

Notes:

↑↓ = Positive or negative → = Magnitude of effect + /●/●●/●●● = Significance at 10%, 5%, 1%, 0.1%[81] respectively – = Not applicable

Source: Drawn up by the authors.

Partner support The indicators used to describe (lack of) partner support do not greatly affect women's decision to have a Pap smear before the Ixchen intervention. Nevertheless, it would be worthwhile exploring what the women interviewed said about gender roles.

Factors determining the performance of a Pap smear *after* Ixchen

To measure the effects on the probability of a woman having decided to have a Pap smear ***after*** the first Ixchen intervention, practically the same probit model was estimated as for the preceding dependent variable, with some additional indicators, specifically:

- level of satisfaction with the services of the Ixchen mobile unit[82];
- whether the women had attended the educational talk given within the framework of the Ixchen programme; and
- the possible costs the check-up may have entailed for the women.

While the check-up itself should not have entailed any cost, because it is free of charge, transport to the mobile unit may entail a cost. Nevertheless, if there is an effect, it is

[81] The significance level describes the probability of error as to whether or not a given event will occur, or in this case whether the variables explain the models. For example: a result with a significance level of $p<0.05$ means that there is a 5% error in accepting a correlation, value obtained or hypothesis. This level does not describe the magnitude of the effect.

[82] In view of the earlier observation made regarding differential recall bias, the results of the survey regarding opinions about services need to be treated with extreme caution.

expected that this will be very small given the mobile nature of the units. For attendance at the talk and level of satisfaction with Ixchen, a positive effect is expected on the probability of the woman continuing to have Pap smears after this contact with the mobile unit.

The results change drastically for this dependent variable. Table 5.3 shows only the indicators with statistical significance in the probit regressions.

Education This variable is not significant, which is perhaps explained by the fact that the sample shows little variation in these indicators, and given that the period analysed is only three years; there is not sufficient variation to be able show effects on going for a Pap smear.

Pregnancy If women have had children before the first Pap smear with Ixchen, the probability of their continuing to have this type of check-up decreases. This is explained by the fact that the vast majority of these women had children before but not after this intervention. Women who did become pregnant during the period after the first Pap smear with Ixchen have a greater probability of having one following this first check-up. Given that because of their pregnancy and immediately afterwards they are in contact with health centres, it is more probable that they will also access Pap smears.

Table 5.3 Probit analysis of factors that might influence having a Pap smear after the Ixchen intervention

Variable	Indicator	Effect	Magnitude of effect	Significance
Children	Dummy: Had children before the Pap smear at the Ixchen mobile unit?	↓	→	●
	Dummy: Had children after the Pap smear at the Ixchen mobile unit?	↑	→	●●
Presence of dependants in care	Dummy: Are there children aged 6 or under in the household?	↓	→	●
Level of satisfaction	Dummy: High level of satisfaction (as compared to low and medium levels of satisfaction) (only in models 19 and 26)	↑	→	– / +
Partner support	Dummy: Has a partner?	↑	→	– / ●
	Index measuring partner support	↓	→	– / + / ●
Membership in an organisation	Dummy: Member of a health organisation?	↑	→	●● / ●●●

Notes:

↑↓ = Positive or negative → = Magnitude of effect + /●/●●/●●● = Significance at 10%, 5%, 1%, 0.1% respectively – = Not applicable

Source: Drawn up by the authors.

Having small children If the woman is caring for dependants in her home, in this case sons or daughters between 0 and 6 years of age, the probability of having a Pap smear performed decreases by 13 percentage points. This is a considerable decrease, and is explained in the Nicaraguan context by the fact that Nicaragua has one of the highest care dependency rates in the world:[83] there are many women in the country who have to look after children under the age of 6. The presence of having to care for dependants between 7 and 12 years of age does not appear significant, as these are already going to school.
The qualitative study confirms that care for small children is a limiting factor for demand for health services (see below).

Cost Given that the Ixchen programme is free of charge and the mobile units minimise the cost of transport to reach the service, the costs the women may have incurred in order to obtain access to the service do not have any significant effect.

Partner support At the same time, the indicators relating to partner support are difficult to interpret, since the two effects are contradictory. In other words, it is arguable whether the partner does indeed have any influence on women's behaviour in the use of Pap smears.

Community participation The results show that working in a health NGO has an effect of more than 25 percentage points on the probability of continuing to have Pap smears.

Level of satisfaction with the Ixchen mobile service The level of satisfaction (see next section) appears to have some effect on the probability of continuing to have Pap smears, although this is not a robust result. It appears to suggest that the intervention has some positive impact on the behaviour of women who have been in contact with the programme.

Educational talk by the Ixchen mobile service The preceding finding is all the more important in the light of the lack of statistical significance of the dummy showing attendance at the Ixchen educational talks.

Context: Gender and health services

The qualitative study yielded some results that may provide context for the demand for health services in general and those relating to SRH and Papanicolaou in particular.

Gender roles

Among the women interviewed, there is a general perception that women are the ones responsible for performing household tasks and childcare. Asked why women are important in the family, one of the informants said:
'...well, because, I, like it says in the scriptures, the woman is the man's support, it's true, because imagine a man alone or at least without a woman or he has children, I don't know, they aren't looked after the same, because the man is working, because sometimes he has to look for someone to leave them with, while if you're a mom then, um, you care for the children better isn't it, no one better than oneself...' [Woman with a positive Pap smear, Dipilto]

[83] UNRISD, to be published shortly.

In most households there are men (partner), and they are identified as heads of the household and assigned the role of ensuring the household provision, support and protection. Even in households headed by a woman, this does not change her traditional role, focusing on household work, childcare, and service to others.

Asked why the man is important in the family, the people interviewed agreed in assigning him the role of provider and protector.
'...Because he is the one who brings food for the women and children. He is the one who faces the problems that come up, and he is the one who bears more responsibility in a home ...'
[Female family member, Ocotal]

Women's work outside the home is seen as a survival activity, necessary above all in the situation of single mothers; it is perceived as affecting the care for the family.
'... I think the ones who suffer are the children, the women who have children... [...] I think it's difficult to go to work outside when you have children, but if someone can pay the person who looks after them, perhaps in that way, is what I say.' [Woman with positive Pap smear, La Dalia]

Most of the women feel free to give opinions and express themselves. Decisions within the couple appear to be oriented towards buying supplies for the home and child care. Most of the women do not participate in community activities despite the fact that they consider it important to do so, and they do not receive any direct support from the community. Activities outside the home are oriented more towards attending religious services.

Care and demand for health services

Most of the women and family members interviewed consider it important to take care of their health, and especially their sexual and reproductive health.
'When I came to the health centre I realised the importance of having the tests, going to see the gynaecologist, doing the Pap smear and the breast examination. Sometimes we women don't go to the clinic because we're embarrassed, and when we do go we don't tell the doctor everything. I always advise to go to the health centre, I always tell my daughters to go to the clinic.'
[Woman with a positive Pap smear, Ocotal]

Health care is identified as seeking attention when illnesses occur; this reflects an approach more inclined to the curative aspect, and very little to the preventive side. When they have children, women show increased concern for caring for their health.

Most women say that they are the ones deciding when and where to seek health services. It is sometimes difficult to convince the male partner that he too needs to make use of the services.
'We were given treatment, but he didn't want to take the drug because he said he wasn't ill. So I talked to him and explained that we had to take the drug together otherwise I wouldn't be cured, both of us had to be treated, and he condescended to buy his drug.'
[Woman with a positive Pap smear, Ocotal]

The decision to seek medical care entails a cost-benefit trade-off between taking care of one's health and neglecting the home, the family and their needs. Among the most sensitive activities are food preparation and care for small children, for which reason women predominantly say that they seek medical care only if there is a perception that their health is in danger. The women seek attention at the health post or health centre; it takes them between ten minutes and an hour to get there. The types of services they go for are general consultation, family planning, Pap smears and prenatal check-ups. The care is free of charge, but most of them find it expensive to seek care because of the costs involved in transportation, buying drugs and examinations outside the health facility.

Valuation of health services

There is a widespread perception that the care provided in public health services is good. Nevertheless, women said that there was a need to improve waiting times, the privacy and comfort of the area where care is provided, responsibility as regards delivery of results and confidentiality in terms of non-disclosure of their health problems in the community. With respect to gynaecological consultations, including the Pap smear, they particularly point out that there should be female staff.

They mention that when they attend the health services in their community or neighbourhood to request health services in general, the procedure to be followed is not explained to them, although they are told what they have. Their perception is that the quality of the health care provided by the facility is related to the medical indications following the consultation (examinations, drugs).

User satisfaction

Of the 634 women surveyed for the quantitative study, 45% said that the Ixchen mobile units had visited their community more than once, although most of them (84%) say that they attended the campaigns only once. Users' general perception with regard to the services received at the Ixchen mobile units is positive: the majority describe their experience as excellent or very good.

Table 5.4 Perception of services received from the Ixchen mobile units (%)

	Care	Quality	Experience	Information
Excellent	52.4	52.1	52.1	47.8
Very good	28.7	27.6	28.2	26.7
Good	16.9	17.8	18.1	17.8
Acceptable	2.1	1.7	1.4	1.4
Poor	0	.5	.2	.2
Very poor	0	.3	0	.2
No response	0	0	0	6.0

Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

Fifty-two per cent of clients stated that the treatment they received was excellent, and only 2% described it as acceptable (see table 5.4).
'At the "robotized" health centre, they don't even look at you. With these women [Ixchen personnel] it's more personal, there's more time to talk, and they ask about your life.'
[Woman with negative Pap smear, Managua]

'It's women doctors who take care of you, and you feel calmer, less embarrassed and more comfortable because there's more privacy during the consultation. They listen, they answer and they are friendly.'
[Woman with a positive Pap smear, Managua]

There was a positive valuation of the treatment received and of the fact that the staff attending to the clients were women; this was a deciding factor in inducing many of the women to have Pap smears. They also appreciated the information obtained during the Ixchen campaigns, although some were not happy with the educational talks being held in the open, which they felt was not appropriate for being a sensitive topic. Most of the clients who recalled the talks said that the topics discussed were Pap smears, cervical cancer and family planning; only one client mentioned violence.

With regard to having the Papanicolaou test, the majority said that both the waiting time before the examination and the privacy were acceptable (95% and 96%, respectively). A few questioned the privacy at the moment when the smears were taken:
'I didn't like it because in the place where they were taking care of me and gave me the results, there were people there who were listening. When they told me what I had, I became nervous and I started crying.' [Woman with a positive Pap smear, Managua]

Textbox 5.1 *Case study*

Rosa María, who received the result of her Pap smear
Rosa María is a housewife who completed secondary school. She went for the Pap smear in August 2009.* Rosa María has a good habit of having a Pap smear every year and the results have always been negative. It was very good for her that the women of the Ixchen mobile clinic came to her neighbourhood to offer the service. The Pap smear was free of charge and so was treatment should any be necessary; in addition, they gave assurances that the results would be delivered quickly.
(*Although this was indeed after the intervention period under evaluation, as the Ixchen programme continued it is felt this is valid as a case study.)

Family support
Rosa María fortunately has a husband who supports her, also in her decisions. He provides the means for her to be able to travel. She lives with her parents-in-law, who help her take care of the house and her son when she needs to look after her health. She has always been told by her mother about the importance of having the Pap smear and looking after her health.

'My mother, through her example and her advice about the benefits of having the Pap smear done every year, has been our best counsellor and motivator. I transmit this information to my cousins and other family members who are still afraid (...), so that we know how we are doing in order to prevent this terrible disease of cancer. (...) I know women who don't have it done out of ignorance, fear. (...) The most important thing is that the cancer can be cured if detected in time.'

The mobile unit and the test

They went very early to the location where the service had been set up. Everything was very clean, the people were very friendly. She listened to the talk and had the Pap smear.

'It was an opportunity for all to learn. No time was wasted, it was quick and the conditions were good. Those who didn't go missed the chance of receiving quality health care ...' [Many women take care of their health only] 'when they feel ill, but few do so preventatively. We should be more aware and take care of our health when we feel healthy, and not just do the Pap smear, there's other care we need.'

The outcome

On the day indicated for delivery of the results, Rosa María went very early to ask for them. But they did not find her results. She was told verbally that her results were negative, that her condition was optimal. Nevertheless...

'...I was very disappointed that they couldn't find my results (...) I was sure they would let me have them, that it was different from when I went to MINSA, when they sometimes didn't arrive. When this happens we feel that little value is attached to the effort we women make to put things aside, to take the time during a morning to have the Pap smear done, it's as if our health isn't important, and for them it's so easy to again say "have the test done again". I think this is the reason why women stop doing it, because they have no confidence in the results being provided.'

If the results had been different...

Fortunately, Rosa María did not need treatment. She heard from other women that those who did need it were sent to the Ixchen clinic or to the Bertha Calderón Hospital, and everything was free of charge. But that is not the only important thing.

'...When a woman needs treatment because the Pap smear result is not good, she feels dispirited and has two options: to go to the public hospital and lose almost the whole day after a long wait, or to go to a private clinic where, because it's expensive, they begin the treatment and then abandon it. Or they don't go at all, with the consequence that the cancer progresses and they die.'

The future

This year Rosa María will also go to the service to have a Pap smear. To ensure the confidence of women in the services, she suggests that the health care personnel should respect the order in which people arrive.

- That the talk given should be clear and that it should be understood, "that they should allow us to ask questions and explain, that helps us talk to other women who have not come."

She also suggests:

- That the talk given should be clear and that it should be understood, 'they should let us ask questions and explain, this helps us talk to other women who didn't come.'
- The place where the examination is done should be clean and private, there should be no one else.
- The person taking care of us should be friendly, ask our name, explain to us what they're doing and what they found after the examination.
- That they should give us an appointment for the delivery of the results, provide them and explain what they found.

Regarding the service quality in terms of the timing of delivery of results, clients again described the delivery as excellent or very good (80% of the total); this coincides with 86% of the women surveyed saying that they had received their results from Ixchen in less than thirty days.

Thirty women (5%) said that they had not received their results from Ixchen. Although this was not necessarily presented as a reason for not having another pap smear, at least not in a significant number of cases, it is noteworthy that the reason for non-delivery relates to the form of delivery itself. When the results could not be handed to the clients themselves because they were not there or contact had been lost, the results sheets were left in sealed envelopes at the nearest health centre, and the women had to go there to pick them up.

In addition, when the women surveyed said that they were not in agreement with the privacy (4%), they referred particularly to the time of delivery, when (as they saw it) the diagnosis was revealed to more than one person in their community, causing them embarrassment.

Although the percentage of women who said that they had not received enough information during the examination was low (14%), it is important to stress that some of the women said that they only had the examination, without having much opportunity to ask questions to the medical staff. Nevertheless, 97% of the women said that they would recommend use of Ixchen's services to a family member or close woman friend. The other 3% (13 women) were clients who did not receive their results.

5.3 Knowledge and attitudes regarding cervical cancer and other sexual and reproductive health issues

Question 2 What is the effect of the intervention in terms of knowledge of and attitudes to cervical cancer and other SRH issues?

Papanicolaou test

Ninety-nine per cent of the women surveyed said that they knew what a Papanicolaou test was, something that is not surprising given that the sample included women who had participated in the Ixchen programme. Nevertheless, 75% had accurate knowledge as to what the examination is used for; on the other hand, among those who did not have accurate knowledge, there were answers relating it to detection of STIs and HIV, and to pregnancy prevention.

In the qualitative interviews, the women recognised that the Pap smear is used to detect cancer, although STIs were still frequently mentioned. A few women identified infection with HPV. The majority indicated that the sample was taken from vaginal secretions and a smaller number mentioned the uterus; very few were able to identify the cervix as the sampling site. With respect to this limited knowledge there is no great difference between the women interviewed in terms of whether or not they were clients of the programme.

Most of the women interviewed, whether or not they were clients, said that the Pap smear should be conducted after sexual debut at intervals from six months to one year. (The identification of this period of time could be related to the frequency with which check-ups were prescribed to women who had had a positive diagnosis during previous examinations.) All the persons interviewed recognised that once there had been a positive diagnosis by means of a Pap smear, the women should attend clinic services, and that if they were treated in time they could be cured.

'Well, if it's detected in time, yes. If you go for treatment, if it's not very advanced.'
[Non-client woman, Dipilto]

The staff associated with the mobile units identified as facilitating aspects for the conduct of a Pap smear the talks in the communities, being invited to have a Pap smear, the support of health brigade members, the fact that the examinations were free of charge and the assurance that the result would be received shortly.

Among the limiting factors, they identified the 'submission' of women to their partners, the lack of a culture of self-care, fear or embarrassment at having an examination, misinformation and religious beliefs.

Of the women interviewed who were not clients of the sectoral programme implemented by Ixchen, some had had a Pap smear at some point in their lives, others never. The reasons for not having a Pap smear differed to some extent:

- Embarrassment
  'If at some time I succeed in having it, it'll perhaps be because someone accompanies me, if someone drags me, because alone it embarrasses me.'
  [Woman who did not have a Pap, La Dalia]

- Fear of 'catching' diseases
  '...Look, I think perhaps some woman is ill... and they do the same check-ups with her and then I go there to get ill...' [Woman who did not have a Pap, La Dalia]

- The belief that not being sexually active keeps them free from diseases
  'On that day I was carrying firewood and when I arrived I had had it already and so, I said, I'm getting on in years, I already have my family, I said, not anymore this time, there's no need to have one.' [Woman without a Pap, La Dalia]

- The fear that their problems will be made public in the community
  '...because they came early in the morning and I watched when they were getting everything ready and asked what they were going to do there and they told me, but people didn't want to go. I know a girl who didn't want to go there because the results were not good and here in the neighbourhood everybody got to know about it because they were not discreet.'
  [Women without a Pap, Managua]

Eighty-six per cent of the women surveyed had had more than one Papanicolaou test in the course of their lives, whether before or after the Ixchen intervention (see section 5.2 above and table 5.7 below). Most of them did so on their own initiative, out of concern for their health (61%) or on medical recommendation (17%) after a pregnancy, operation or gynaecological consultation.

Of the women responding, 71% first learned of the Papanicolaou test through MINSA campaigns, whether in the mass media or in the various public health facilities. Fifteen per cent of those surveyed said they had heard of the Papanicolaou test for the first time in the Ixchen mobile units.

This is confirmed by the interviews. The majority indicated that they already had knowledge about the Pap smear and cervical cancer from before they came to the mobile unit. The sources mentioned vary: radio, television, NGOs working in the community, health centres, women friends and family members, and also directly through the Ixchen programme.
'...when you hear talks on the radio or television, then you see and the workshops help you quite a lot. At least I remember that I received quite a lot of workshops from the Ministry of Health, from Fundemuni, also from Ayuda en Acción***... in this way you come to realise.'***
[Woman with a negative Pap, Dipilto]

For a group of 220 women (35% of the total in the sample), the Pap conducted by the Ixchen mobile units was the first in their lives; most of these women were aged between 21 and 30 at the time of this first Pap. Many more women were aged between 13 and 20 at the time of the first Pap in their lives, which was conducted in a public health facility or the equivalent of a health centre, or regional or departmental hospital.

With regard to knowledge of cervical cancer, 76% of the women surveyed said that they knew what cervical cancer was, although 33% of this group said they did not know why the disease occurred in women, or gave incorrect reasons for its incidence. Among the women with a positive Pap diagnosis the level of knowledge is also low, but slightly higher than among those with a negative diagnosis, especially as regards awareness of the reasons why women have cancer. Fifty-four per cent of the women with a positive Pap believe that it is an illness transmitted by the male companion or partner (46% of the women with a negative Pap).

At the same time, the persons interviewed said that they were unaware of its origin, and there was a widespread perception that it was related to STIs and having multiple sex partners. All the persons interviewed recognised that it is an illness affecting women, but nevertheless the clients identify sexual behaviour and not having an examination as a risk factor.

'Women who have irregular sex lives get it, they don't go for check-ups or have the exam.'
[Woman with a negative Pap, Managua]

'There are some who referred to a woman who has several partners.'
[Woman with a positive Pap, Matagalpa]

With respect to gynaecological consultations, including the Pap, the interviewees note in particular that there should be female staff:
'One of the things that's always said is that you didn't go for a check-up or have the Pap done, or the woman when she realises it herself, it was out of embarrassment that she never had one, the gynaecologists were men, or she didn't go to the health centre because there were a lot of people.'
[Key informant, local authority]

Most of the interviewees said they did not know women diagnosed with cervical cancer in their community; those who did know women with this diagnosis did so because they were people very close to them (family members and neighbours). Opinions are divided regarding the attitude of the community when these cases become known.
Some of the women say that there is solidarity and offers of support:
'...people say afterwards that if they'd seen her before, they would have treated her before, they would have called before, but sometimes although someone tells you...sometimes they don't look after their own lives, you understand? They neglect themselves, it's as if I was ill and didn't try to go to the clinic in time, I would be neglected myself, that's when it gets to the point of terminal cancer, when we can't do anything anymore...' [Woman with a positive Pap, Dipilto]

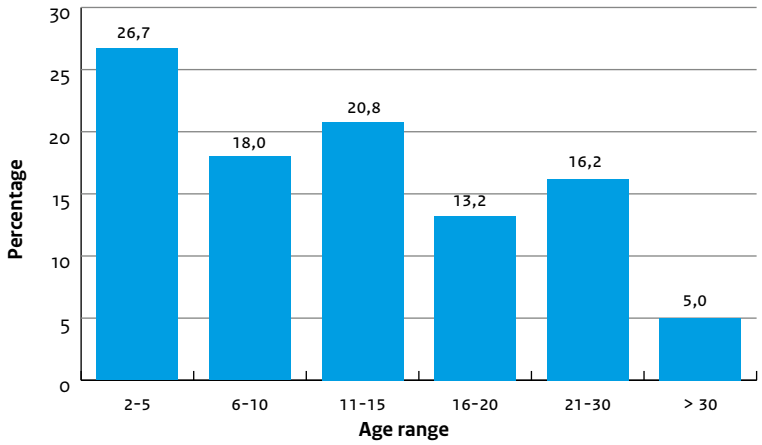
Others indicate that there is fear and alienation, because of the belief that the problem is contagious or that the woman brought it on herself by having several partners.
'Some people, they think you shouldn't get close to this person or that you have to walk a little apart because this person has cancer, other people say no, this is not contagious.'
[Woman with positive Pap, Dipilto]

'Look, men think that if a woman has cancer it's because she's had several partners and it's not like that, there's no need to have had a number of partners to have the disease, because as a woman you're at risk of having the disease, and they don't understand.' [Woman with a positive Pap, Ocotal]
'Well, most people who are, who perhaps don't know, begin to judge a woman, they say that because she's been with one, been with another and that's not true, whoever gets ill, gets ill without needing to have sexual relations.' [Woman community leader, Dipilto]

Other aspects of sexual and reproductive health

The women were asked the approximate date of the first care they received in their lives relating to their SRH. In 27% of the cases, the first care was received between two and five years before the survey was conducted (see figure 5.5). By age group, at least 46% of women who had care two to five years before the interview were aged under 35 on that date. Of the women also receiving care for the first time during that period, 18% were aged between 36 and 45, while 34% were older than 46.

Figure 5.5 *Years lapsed since first SRH-related care*



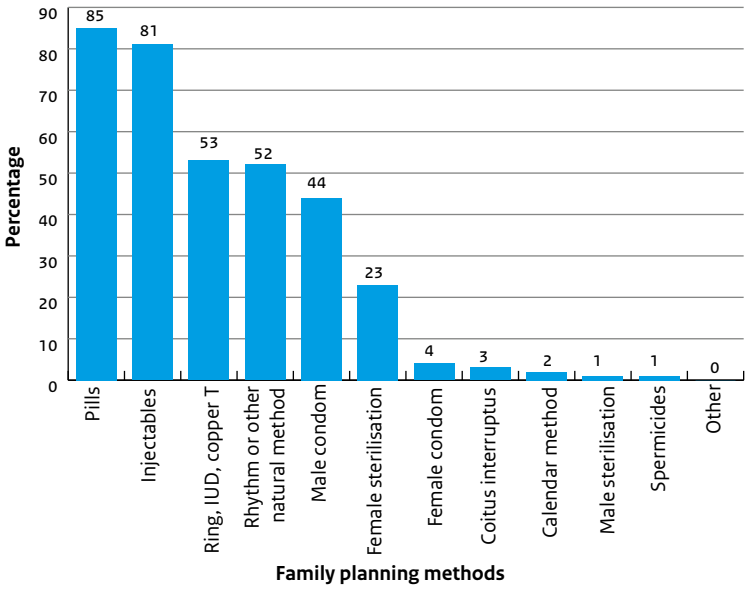
Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

Of the total number of women surveyed, 63% received their first SRH-related care in a public health facility, where it related above all to maternity or family planning services; 23% said they had received their first care in an Ixchen mobile unit, primarily for getting a Papanicolaou test. Moreover, 75% of the women surveyed had had prenatal checks during their last pregnancy, on average about seven during the course of the pregnancy, in most cases from the second month after knowing they were pregnant.

If the number of years since first lifetime SRH care of the women surveyed is divided into age groups on the date of the interview, it is to be expected that the youngest women will for the most part have received care for the first time between 2 and 10 years previously, because they have less possibility of having received care before that. Nevertheless, it is interesting to note that a substantial group of women over 36 (14% of the total sample of 634 women surveyed) received their first care a few years previously (2 to 5 years); this coincides with the intervention by the programme and the fact that for many women the first Pap smear with Ixchen was also their first contact with any SRH service such as Papanicolaou, gynaecological consultation, delivery and post-natal care, domestic violence and other examinations.

Of the women surveyed, 95% know of at least one contraceptive method; 57% know between one and three methods, and 38% know four methods or more. For the majority of women surveyed, the best-known contraceptive methods are the pill, injectables, intrauterine device (copper T), the rhythm method, male condoms and female sterilisation.

Figure 5.6 *Knowledge of different contraceptive methods*



Source: Drawn up by the authors on the basis of data from the CDR-Ixchen survey (2011).

Seventy-five per cent of the women surveyed are using a family planning method. Of this percentage of women, most use female sterilisation (59%), followed by injectable methods (24%), pills (10%) and male condoms (4%); other methods such as an IUD and the rhythm method account for 3% of the cases of women using some contraceptive method. The women not using any contraceptive method (25% of the total) are for the most part of older age and can no longer have children, or at the moment are not sexually active.

Table 5.5 Contraceptive methods used by the women surveyed		
Methods	**No.**	**%**
Pills (monthly)	29	6.1
Pill (day after)	18	3.8
Injectables	114	24
Ring, IUD, copper T	11	2.3
Rhythm or other natural method	4	0.8
Female sterilisation	282	59.4
Male condom	17	3.6
Total	**475**	**100**

Source: Drawn up by the authors using data from the CDR–Ixchen survey (2011).

Influence of gender relations on SRHR

The women surveyed show a certain degree of openness to discuss SRH topics within the family or with close friends. In the real situation of the households of the women who stated that they know the disease, in 37% of cases only the interviewee knew about the disease, while the rest of her family, even when it consisted of adult sons or daughters (with their own partner and even children) had not heard of it. Of the 505 women surveyed who said they had a partner (79%), 70% said that they talked with their partners about SRH topics, while 22% said that they did not do so because it was not something they would like to do; similarly, there was some degree of interest on the part of husbands or partners to talk about these topics (8%).

A very low percentage of the life partners of the women surveyed did not agree with them having a Papanicolaou (1%), while 87% of the women said that they did have their partner's support for having the Pap smear, and that their partner was in agreement that the test should be performed. Only a few women said that they needed to ask their partner's permission to have a Papanicolaou (12%).

These findings are partly confirmed by the qualitative interviews. Most of the women state that they are the ones deciding when and where to seek health services. They discuss family planning and child-raising with their partner; the women with a partner indicated that he was in agreement that the Pap smear should be performed. This was confirmed by the male partners interviewed.

5.4 Use of other sexual and reproductive health services

Question 3 What is the effect of the intervention on the target group's use of other SRH services offered by the public, private and NGO sectors?

Views on SRH services

Type of services known, sought and received With regard to the question as to what services they knew were offered by the Ixchen mobile units, the data indicate that while all the women surveyed knew that the mobile units conducted the Pap smear, 35% of those surveyed also knew that the mobile units provided talks relating to SRH and a further 27% knew that a gynaecological consultation service was also provided.

With regard to the services they were seeking when they attended, 90% of the women surveyed said that they had gone for a Pap smear. Seven per cent of the women said that they had gone not for a Pap smear but for other services such as mammograms, drugs and even general consultations. Three per cent of all women surveyed said they had attended the campaign to ascertain what services were on offer.

With regard to the services the women said they had finally received from Ixchen, 24% of the women surveyed said that apart from the Pap smear they had also received a gynaecological consultation, and 32% also received a talk on SRH education. Given that 35% of the total number of women surveyed knew about the talks, this indicates that almost all those who knew about the talks attended, and that the remainder (who did not attend) may not have done so because of lack of awareness of the service. Although the women generally felt that they had received all the services they needed from the mobile units, 11% considered that they had not received everything they needed, with a majority indicating the need for mammograms and ultrasound tests to be conducted in addition to the gynaecological consultation.

Trust in and confidentiality of SRH services Regarding the gynaecological consultation, which is one of the services also offered by the health centres, in many cases the women indicated that they were not comfortable getting these from local staff who knew them and very often belonged to their own communities. This same concern was expressed with regard to having the Pap smear done in the nearest health centres. In these cases the Ixchen mobile units played an important role, by giving the women the confidence that the examination would be conducted by health personnel from outside, offering them discretion in their examination and their diagnosis.

Access The closeness of the mobile unit was one of the important factors stressed by the women as an advantage of using the services offered. In 82% of cases the mobile unit was located 15 minutes or less from the clients' homes, so that in most cases (95%) the women did not have to spend any money on transport or travel to have the test conducted.

During the days when Pap smears were offered, the staff of the mobile units identified women in situations of domestic violence. These were referred to the Ixchen departmental offices for counselling and support.

'...There was also like an environment of solidarity, then, with the woman. If the woman went into crisis when she was given her result, as I'm a psychologist, I did an intervention to deal with the crisis. I had to give many psychological consultations, many, many psychological consultations, because we also find, in addition to women who did not have the Pap smear done, women who were victims of domestic violence or sexual violence. So, then, in these cases as well we offered services to these women. In other words, this is like an added service, an added value in the work we were doing, because I was hired as an instructor, not as a psychologist, but as I am a psychologist, when I was called on to give consultations I gave consultations in addition to that.'
[Instructor, Ixchen mobile unit]

Demand for other SRH services

Following the care by Ixchen, one of the results sought was to create long-term awareness among clients regarding the services, which would be reflected in the use of other SRH services, the channelling of demand towards other health facilities and the reorientation of the women in the search of these types of services, which are normally not seen as a necessity. Of all the women surveyed, 58% sought other SRH services after the Ixchen intervention.

Seen from the standpoint of women with unfavourable diagnoses, 85% of the women with a positive Pap smear, with lesions, cervical cancer or HPV, sought additional SRH services after having the Pap conducted by Ixchen, as compared with 55% of the women with a negative Pap who sought services after the Ixchen intervention.

The women who sought health services after the Ixchen intervention were looking primarily for a Pap smear (40% of the total), and the majority of them (63%) did so at a public health facility. If the types of services are divided by facility, it is apparent that for all types of services sought the public health facility was one of the main places for receiving follow-up. There were also some cases of women who returned to have a Papanicolaou conducted in a mobile unit, representing 17% of the women who had a Pap smear conducted after Ixchen (see table 5.6).

Of the 272 women who had Pap smears before and after Ixchen (that is to say in addition to those who had a Pap smear performed in the intervention period 2006–2008), awareness was related not to the intervention, but rather to the fact that the women were already accustomed to having the examination performed. Nevertheless, among the women who had not had Paps conducted before the Ixchen intervention and who sought SRH services afterwards, 74% of them went for a Papanicolaou, while 20% went for a gynaecological consultation. This indicates significant knowledge of the main services that were provided by the mobile units. This generated greater demand for SRH services in public health facilities, where 62% of the women went for the service.

Table 5.6 Post-Ixchen demand for SRH services by type of health care facility			
Service	**Place**	**No.**	**%**
Gynaecological consultation	Public health care facility	47	65.3
	Private health care facility	11	15.3
	Profamilia clinics	3	4.2
	Ixchen clinics	4	5.6
	Community facility	2	2.8
	Health care team in community	1	1.4
	Ixchen mobile unit	4	5.6
	Total	**72**	**100**
Papanicolaou test	Public health care facility	150	57.9
	Private health care facility	36	13.9
	Profamilia clinics	2	0.8
	Ixchen clinics	9	3.5
	Community facility	5	1.9
	Health care team in community	14	5.4
	Ixchen mobile unit	43	16.6
	Total	**259**	**100**
Family planning counselling and methods	Public health care facility	15	100
Ante-natal care	Public health care facility	4	100
Delivery and post-natal care	Public health care facility	7	100
Operation	Public health care facility	7	100
Other (Treatment for cervical cancer)	Private health care facility	1	33.3
	Ixchen clinics	1	33.3
	Community health care team	1	33.3
	Total	**3**	**100**

Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

In comparison, all the women interviewed in the qualitative study showed that they had been made aware of the importance of having a Pap smear. For those whose diagnosis was positive, having had the opportunity to receive timely treatment was important to their lives. They all said that they were prepared to repeat the experience every six months to a year, and to recommend it to family members or friends, thus preventing death from cancer.

Regarding attitudes towards the Pap smear, a difference is apparent between the women who had already had the test performed and those who had never had one. The former report that they are prepared to repeat it periodically, the most committed being those who were treated for illnesses detected during the examination, and they even go so far as to promote the examination among their family members and acquaintances. The women who had never had a Pap smear expressed many fears which limit demand for this service, even though they recognised the importance of having it done.

According to the health personnel interviewed, the women generally behaved responsibly regarding the Pap smear and their subsequent check-ups.
'Women immediately followed the referrals. When given appointments they generally attended, they adhered to their treatment. If they needed treatment, they did so appropriately, following instructions. If, for reason X, Y or Z, the client did not show up for the appointment, they [female Ixchen staff] ***called to inform us.'*** [MINSA management staff, Matagalpa]

With regard to whether they felt the women had in any way changed their way of thinking and acting in relation to care for their health, the Profamilia care staff replied:
'Yes, there is a change: there is more concern among clients, more attendance for the check-ups, more participation in having the annual Papanicolaou and its customary practice.'

There is no indication that having or not having children after the intervention bore any relation to the demand for other health services after Ixchen; in any event, women without children also continued to seek health services.

Nevertheless, there is an apparent effect of education on the demand for other SRH services after Ixchen, in that 10% more women who had had at least one year of education sought additional health services as compared with those who had no education, and among them, in addition to presenting themselves for the Papanicolaou test, there was a greater inclination to seek gynaecological consultations than among those without education.

Of the total of 115 women in paid employment, 65% decided to seek further SRH services after Ixchen, as against 56% of those who were not in paid employment. Ten per cent more women in paid employment went for services in private health facilities, and also requested more gynaecological consultation services.

The qualitative interviews conducted with staff of the Ixchen, Profamilia and MINSA services showed that contact with the programme, and in particular with the early lesion treatment clinics, stimulated demand for other services. These were related to family planning methods and specialised examinations such as ultrasound.

Table 5.7 Relationship between demand for other services and frequency of Pap smears, pre- and post-Ixchen			
When were Paps performed?	**Demand for other services afterwards**	**No.**	**%**
Before and after	No	27	9.9
	Yes	245	90.1
	Total	**272**	**100**
Only before Ixchen	No	123	86.6
	Yes	19	13.4
	Total	**142**	**100**
Only after Ixchen	No	30	24.2
	Yes	94	75.8
	Total	**124**	**100**
Only with Ixchen	No	86	89.6
	Yes	10	10.4
	Total	**96**	**100**

Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

5.5 Treatment of clients with cervical cancer

Question 4 What is the effect of the intervention in terms of number of people correctly treated (discharged) for cervical cancer compared to the without-intervention situation? What are the main factors that explain (start and continuation of) treatment and drop-out ratios?

Net effect

The difference between the Ixchen mobile clinic programme and the counterfactual situation has already been calculated, and it was concluded that the net effect of the Ixchen mobile clinic programme in terms of Pap smear coverage would be between 42,003 and 46,113 Paps (see figure 5.3).[84] This represents the number of 'extra' persons covered by the programme.

'Extra' women treated

From these figures we can calculate how many 'extra' women received treatment as a net effect of the programme. On the basis of table 5.8, we arrive at a total of between 486 and 1,188 'extra' women receiving treatment as a net effect of the programme.

[84] Confidence interval of 90%.

Life years saved

The calculation of the number of life years saved in this programme is based on a series of factors:

a. the different types of diagnoses and their probability of progressing to cervical cancer;
b. average survival for each type of diagnosis;
c. average age of the women treated for each type of diagnosis;
d. life expectancy of women in Nicaragua; and
e. calculation of the life years saved for each type of diagnosis (d-c-b); these are then added together.

In addition, it must be recognised that (i) only a percentage of the early lesions would have developed into cervical cancer and (ii) there were no data on the final outcome for non-attending, transferred and pending women, who account for no less than 60% of the total. (See annex 4 for details.)

To take the unknown elements into account, we opted for calculating a minimum and a maximum of life years saved.

- The minimum represents the women discharged by the programme, about whom we have more information. For this group, we worked with assumptions regarding progression towards cervical cancer (in the absence of treatment) for each type of diagnosis.
- To calculate the maximum life years saved we used the same assumptions, applying them to the total number of women discharged, not attending, transferred and pending (optimistic number).

Table 5.8 Net effect: 'Extra' women correctly treated by the programme

Category	Including only women captured by the mobile units		Including all women captured by the mobile units, MINSA and other organisations
Number of Paps conducted - total	66,521		68,742 (66,521+2,221)
Number of positive Paps	2,211		4,432 (2,211+2,221)
Women discharged - number	770		1,771
Women discharged - rate	1.16% (770/66,521)		2.58% (1,771/68,742)
Number of Paps conducted – 'extra' (confidence level 90%)		42,003 – 46,113	
'Extra' women discharged – number (applying the rate)	486 – 534		1,082 – 1,188

Note: Results from the Ixchen database, which could not be verified. Also based on the 40% of women with a positive Pap result who were discharged; does not include the 60% regarding whom no specific information was found. In practice, then, the effect could be stronger.

Source: Drawn up by the authors on the basis of the calculations presented in annex M (CD-ROM).

It is also important to distinguish between the results for the women captured by the mobile units and the total number of women treated, of whom more than half were referred by MINSA and other organisations. The total life years saved increases substantially if we include them all.

Table 5.9 Life years saved, taking into account various factors

Category	Including only women captured by the mobile units	Including all women captured by the the mobile units, MINSA and other organisations
Life years saved – minimum (based on 40% discharged)	6,556	12,500
Life years saved – maximum (based on total, including estimated total based on an extrapolation to the 60% with incomplete data)	23,323	42,683

Source: Drawn up by the authors.

In accordance with table 5.9 and only including the women captured by the Ixchen mobile units, the total arrived at would be between 6,556 and 23,323 life years saved, whereby the variation relates to the 'minimum' and 'maximum' scenarios. If we also include the women referred by MINSA and others, this increases up to 42,683 life years saved. The number of life years saved is based on the total number of women treated and discharged by the intervention and can be partially attributed to the programme.[85]

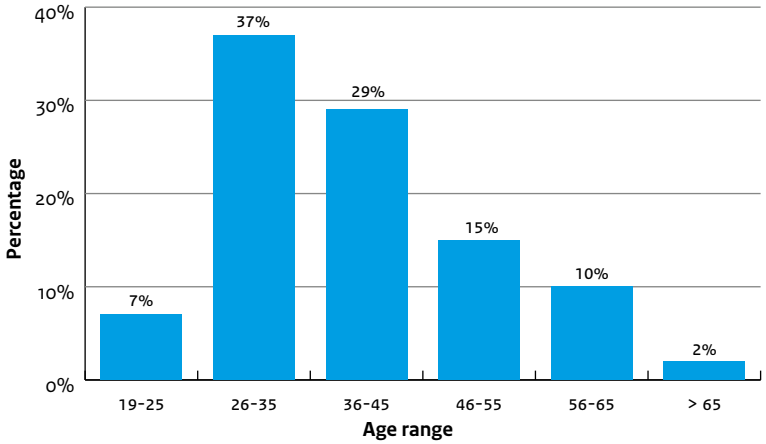
Profile of clients with a positive Pap diagnosis[86]

Of the 634 women surveyed, 71 had a positive cytology, of whom 59 were diagnosed during the Ixchen intervention and 12 were diagnosed before. Of these women, those detected during the programme were in the age range from 19 to 74 at the time of the survey, in other words 14 to 69 at the time of the Ixchen intervention. Sixty-six per cent were in the age range 26 to 45 at the time of the survey, which coincides with the general age range of the women surveyed.

[85] Estimations of life years saved are not presented here in terms of net effect. Calculations of the number of life years saved directly attributable to the programme ('extra' life years saved) would need to be based on the net effect of the programme calculated in table 5.8 ('extra' women correctly treated) and this would require (i) making assumptions about the difference in characteristics (diagnosis, age) between women who would anyway have had a Pap smear (non-intervention scenario) and those whose Pap smears are a direct result of the intervention, and (ii) applying the net effect 'range' calculated in table 5.8 to each of the four scenarios presented in table 5.9.

[86] Annex K (CD-ROM) presents the profile of clients with a positive diagnosis in more detail.

Figure 5.7 *Age range of women with positive diagnoses (cases detected in the programme)*



Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

Note: The 19-year-old women were included in the 19-25 (previously 20-25) age group, given that there are not sufficient observations for another smaller category.

The women were asked about their diagnosis, which was based above all on their personal perception (not on a medical diagnosis over and above the fact that they had a positive Pap result). Unfortunately, it was not possible to corroborate these diagnosis perceptions because not all the files of the women in the sample of positive cases were available. The women who said they had been diagnosed with HPV amounted to 25% of the total; 44% were diagnosed with early lesions, indicating a lesser advance of the disease in the sample selected; even so, the foregoing may be biased by the women's relative lack of knowledge of their actual diagnosis, as well as of the type of lesion identified.

With regard to treatment of the women diagnosed during the Ixchen intervention, 44% received pharmacological-type treatment (see table below); others received treatment such as cryotherapy (25%), coinciding with the relative presence of HPV among the women with a positive Pap result, and hysterectomies (12%), all of which involved women over the age of 35. Only two cases of women who received chemotherapy or radiotherapy were found.

Views on diagnosis and treatment

Diagnosis

According to the information obtained in the survey, 16% of the women with a positive diagnosis said they had not received all the necessary information about their treatment; the remaining 85%[87] said they had received all the necessary information about their diagnosis and the treatment to be followed.

[87] The total is more than 100% for reasons of rounding.

The clients with a positive Pap result who were interviewed said that they had been informed of their diagnosis by the staff attending to them at Ixchen's or Profamilia's early lesion treatment clinics; however the information was not very specific.
'The people from the team came here and I went, and I came out with a problem. They told me I had a scaly black spot and that I would have to have my uterus taken out because it had not yet spread to the ovaries and that she didn't want it to spread to the other organs and they sent me to the Bertha [Calderón hospital] for an operation.' [Woman with a positive Pap, Managua]

'They told me I had the infection, a patch of skin that would have to be looked at ...'
[Woman with a positive Pap, Ocotal]

'I brought the Papanicolaou test result and they explained to me there how it had turned out and what it was and what they were going to do. That I had an infection in the cervix, of the uterus, and that they had to do surgery on me because it was a little advanced already and that this was what was bothering me, they had to remove it. They didn't tell me I had a tumour in the cervix.'
[Woman with a positive Pap, Matagalpa]

Impact of the diagnosis

On learning the results, the women experienced feelings of sadness, fear and concern. Most of them shared the results only with their partner or a family member (mother).
'It was a horrible experience for me, maybe he was not careful having a sexual relationship, that is why I caught a sexually transmitted infection, and due to that they told me that was how I had contracted a chronic inflammation [...] it seems it was in the cervix.'
[Woman with a positive Pap, Dipilto]

'It was an experience I wouldn't wish on anyone, I believe it was my fault because I had been unfaithful.' [Woman with a positive Pap smear, Managua]

'I was frightened and distressed, then sometimes I even cried and sometimes they said to me, "But, what is it you've got there?" And I said: I don't know until they operate on me. You know that people don't have the confidence to talk about these things. You feel afraid, nervous somehow, as you don't know what type of illness it is, whether it's malignant!' [Woman with a positive Pap, Matagalpa]

Treatment

The women indicate that the treatment they received in the Ixchen or Profamilia clinics lasted from one to eight months. The number of visits to the hospital or clinic varied between two and eight. Most of them said that they felt very well and happy after the treatment.
'I had the treatments, after that there was nothing more that came out, and then I felt happy when the doctor told me I didn't have anything at all.' [Woman with a positive Pap, Dipilto]

Most of the women interviewed completed their treatment. They said that what motivated them to start and continue their treatment until it was over was the explanation that they had

a 'problem' which could turn into cancer if it was not treated; and the fear of dying from it. Aspects which facilitated their decision to attend were that the diagnostic services and treatment were free of charge. Having someone to leave their sons and daughters with (those who couldn't bring them along to the consultations) was seen as a very important aspect when small children were involved. In addition, they had financial support from their partner and/or family.

Textbox 5.2 *Case study*

Doña Solingalpa, referred to Ixchen by MINSA with a positive Pap and completed the treatment

The events
Doña Solingalpa is a divorced woman aged 51, who sells bread in the street. She had nine children who are already adults, she does not know how to read or write. When she heard on the radio that it was a good thing to have a test done called Papanicolaou, she took the decision to go to the nearest health centre.

The diagnosis
It was her first Pap, and was conducted in the Trinidad Guevara Polyclinic in Matagalpa in April 2007. After three months the doctor came to her home to give her the result and the referral to the Ixchen clinic for confirmation of the result, as it was positive.
'That day she gave me the paper, a little piece of paper, and told me go to Ixchen, they'll take good care of you there.'

Doña Solingalpa immediately went to the Ixchen clinic in Matagalpa, where they conducted a colposcopy and biopsy. They detected cervical cancer which needed treatment.

The treatment
The diagnosis justified her transfer to the Cesar Amador Molina Hospital on 23 May, and from there to clinic number 4 in the Bertha Calderón Hospital, Managua, where a radical hysterectomy (removal of the uterus) was performed.

Looking back: Strengths, obstacles and stress

Sharing with someone
The first obstacle Doña Solingalpa had to overcome was uncertainty. After that, embarrassment. This was a stressful factor for Mrs. Solingalpa, who never told her children, family members or friends about her diagnosis.
'I was embarrassed, I didn't tell him anything. Here I had a son and he said to me, "What is it you've got?" When he said that, I started crying because it made me embarrassed. You know, we feel embarrassed having such conversation with your children. (...) You know that one doesn't have the confidence to talk about these things.'

The decisive moment for revealing her diagnosis was the surgery, which she had to undergo in the Bertha Calderón Hospital. So she called a daughter living in Estelí, because at the hospital they asked for a family member to make a blood donation so that the surgery could be scheduled. That was what led her to finally share her diagnosis, and her daughter travelled from Estelí to give her support.

Money
The second obstacle to seeking treatment was the money needed to travel to Managua. She had to earn the fare by working, for which she had to make savings from the little she earned in the day by selling bread in the street.
'Only the fares ... On Mondays I earned 200 to 300 pesos. With that I was able to manage everything.'

The commitment of the health personnel
Doña Salingalpa says that the doctor who cared for her in her health facility was concerned for Doña Solingalpa to know her result and be referred for treatment in the Ixchen clinic. The Ixchen personnel guided her to the appropriate level for the seriousness of the disease. The same was true of the post-operative situation.

The support of a family member
Her daughter in Estelí, when she heard her mother's diagnosis, was concerned and supported her at all times including the surgery, managing the blood donations, and caring for Doña Solingalpa in the post-operative and recovery phase.

Understanding what she had
Although she was not told the real name of the disease, she was advised of the need to obtain treatment and get cured.
'The female doctor only told me I had an infection ... they didn't tell me what the illness was, they said it was an infection in the cervix, when they were going to operate the male doctor only said that this would stop the illness and to do that they would take out the uterus because I had no damage to the rest.'

Determination to be cured
'One's preoccupation, being preoccupied for one's health. (...) My mind was made up because you know one can be so concerned for the children because sometimes they worry that you won't be there.'

A good transfer and counter-referral
'First they were checking up on me in Managua, but when I missed an appointment the doctor had me transferred here [Matagalpa].'

Good follow-up
'It's four years since I was operated on and thank God they are checking on me... now I have an appointment in the hospital (Matagalpa) for 6 October (2011).'

A happy ending
Doña Solingalpa talks about her experience to other women.
'Of course, sometimes a lady and I start chatting, and I told her, and she says that she suffered from that, from the illness and she says that the illness was worse for her because it caused her pain.'

Doña Solingalpa's reply, when she would have to advise another woman with the same diagnosis, what she would say:
'Well, I would say to the lady suffering from uterine cancer... I'd say, Why not have the operation? Thank God I could support myself. Then she says to me, who will come to look after me? No, go to have your check-up in the hospital. See to it that they will operate it and you are not going to die. I tell her, When I know that you've had the operation, I'll help you. I'll bring you a bite to eat.'

If the disease returns
'I don't think so, because God comes first, I don't think so. Because as I told the doctor, let them take out up to the uterus so that I won't have problems, that afterwards there won't be even a trace left, nothing.'

Doña Solingalpa feels well
'I feel at peace, I don't feel ill anymore (...) I feel happy, thanks to God. As if the Lord had made me new again.'

The main obstacles cited by the women for going for treatment and following up on it were fear of the treatment, lack of support for childcare, employer's permission and lack of money for the travel, drugs and other costs associated with the treatment.
'Some of them out of embarrassment, others because they say it hurts, others because it makes them afraid.' [Female local leader, Dipilto]

'Because of the family, since they are single mothers and say they have no time, because of money, nobody assists... The man also has an influence due to jealousy or lack of trust.'
[Male community leader, Ocotal]

The longer the distance between the home and the health services, the higher the costs of travel and these further increase if the client has no option but to take her children with her. The main support for childcare in the absence of the women are the other family members; there are no community initiatives to support them in this respect.

With regard to the cost of treatment, they report that the procedures were free of charge, with the exception of one woman who had to pay 600 córdobas for the colposcopy and biopsy.[88] Nevertheless, most of the women had to buy the drugs and finance their travel to the places of treatment.

[88] The circumstances in which this charge was made are unknown, since care under the programme was free of charge.

The majority said they had been given recommendations and appointments for post-treatment check-ups. Some kept the appointments, but others had the check-ups performed at their health centre or in other local NGOs for reasons of accessibility.

The fact of having someone to go with them – most said they went alone – or to look after their property, which many of them said they left locked, does not appear to have been a determining factor in deciding whether or not to go for treatment.

Non-attendance of and defaulting on treatment

The staff of the mobile units says they know of few cases of drop-out in the treatment phase or post-treatment check-up. Nevertheless, they indicate various reasons for the known cases. Other categories of respondents also mentioned various reasons. All of these are summarised in table 5.10.

Table 5.10 Reasons for non-attendance of and defaulting on treatment by category of respondents (qualitative study)

Women interviewed	Staff of mobile units	Staff of early lesion treatment clinics	Management staff	Community and local agents
Fear of treatment	Fear of treatment		Fear of treatment	Fear of treatment
Childcare	Childcare			Childcare
Lack of money	Lack of money	Lack of money	Lack of money	Lack of money
Machismo, the man's jealousy, man's permission	***Machismo***, the man's jealousy, man's permission		***Machismo***, the man's jealousy, man's permission	***Machismo***, the man's jealousy, man's permission
	Perception of risk			
			Internal migration	
			Remoteness of communities	
			Religious beliefs	
				Low self-esteem, embarrassment

Source: Drawn up by the authors.

The summary confirms something already observed in the probit model with regard to factors limiting the use of services for the Pap smear, namely the importance of care for small children. The point is, who can the children be left with?

What other men and women consulted do not mention in terms of obstacles is the issue of psychological support for the women:
'In principle I believe it is related to the psychological side, because basically if a woman is diagnosed with cancer, she has only the medical and not the psychological team, so then she needs to receive psychological care because she sees it as a synonym of death, so she says: Why should go if I'm going to die? But if we give her psychological care we increase her self-esteem, explain the whole process and all the different phases she's going to go through, and the opportunities she will have to deal with the problem, I think the woman will not drop out. But if she and the family are not given psychological care... because the family plays a very important role in the self-esteem network and above all in how to treat her because her self-esteem became weaker.' [Female local government official, Ocotal]

According to the staff at the treatment clinics, the elements that contributed to women not dropping out of treatment were '***knowing the result, the stage, the fact that they could be cured***'.

At the same time, and contrary to these views of the clients themselves, some staff of the mobile units and some community leaders identified lack of permission from the man, male jealousy and 'the partner's ***machismo***' as reasons why many women with a positive Pap result do not seek and adhere to treatment.

A factor which limits bringing back clients who dropped out of treatment was that, when they came to the mobile units, their home address was not properly recorded, or clients were captured at coffee or tobacco cooperatives or estates, and their address was not recorded.

Of the total of 13 interviewees with a positive Pap result, all began treatment, but two women defaulted. One did not go for the check-up following treatment, withdrawing without having been discharged. She said she did not return for the check-up because she thought that after the '***cleaning***' they had performed on her she had become '***clean***'. Although they told her she should go for check-ups, she did not feel it was necessary to go back. The other said that dropping out was because of 'neglect, lack of time and money'.

Systematic analysis of the treatment chain (quantitative study)

General description of the treatment chain

In accordance with the intervention logic, the women with a positive diagnosis were asked what steps they had taken after being diagnosed. This made it possible to reconstruct the points where they might have dropped out of the treatment chain, or to determine whether they had not attended any stage of it. This analysis covered all the women with a positive Pap result found in the CDR–Ixchen survey (71 women).

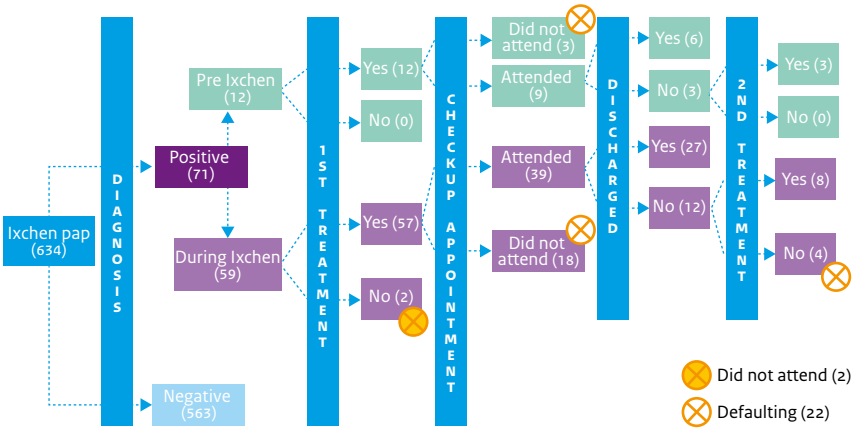
In reconstructing the programme's treatment chain a distinction was made between the women diagnosed during the intervention (59) and those diagnosed beforehand (12) (see figure 5.8). For each section of the treatment chain, the numbers of women who did or did not participate in each stage were assigned. The treatment chain extends from:

(1) diagnosis of the disease;
(2) first treatment;

(3) first check-up appointment to ascertain whether the woman can be discharged or requires a second phase of treatment; followed by
(4) a second treatment.

The chain extends to this phase because the women surveyed did not go beyond this in their own treatment chain, in other words they were pending follow-up (8 of the 59 women); or they dropped out at this level of the treatment chain (4/59).

Figure 5.8 *Logic chain of the Ixchen intervention in the positive cases*



Source: Drawn up by the authors.

Of the total of 59 women surveyed who had a positive Pap result detected during the Ixchen intervention, two women (3% of the total number of women with positive Pap results) did not start treatment. The reasons indicated by the two clients included lack of money since she considered that the treatment was very expensive, and not being able to receive treatment because she was pregnant.

One of the two main findings in the treatment chain drawn up with the data from the survey relates to the 'defaulters'.[89] It is apparent that 22 women (37% of 59) dropped out of the treatment chain at two specific phases: the first in the middle of the chain, after the first treatment (18 women, 30%), and the second at the end of the chain after the first check-up appointment and referral for a second treatment (4 women, 7%).

[89] 'Did not attend' and 'defaulting'; although Ixchen did not include this latter category in its data, it was felt relevant to distinguish this category from those 'not attending'. The women not attending were those who after being diagnosed decided not to begin any treatment; on the other hand, the women who dropped out of the treatment chain were those who began with a potential treatment and after that ceased attending, whether the check-up appointments or the subsequently recommended treatment; for this reason they were not discharged or declared cured.

Textbox 5.3 *Case study*

Oyanka, who had a positive Pap result but did not complete the whole treatment

Oyanka defines herself as a woman whose health 'is complicated'. By the time she received the result of the Pap smear in 2007, conducted in the Lacayo Farfan Health Centre in Matagalpa municipality, she had already been hospitalised for severe venous thrombosis of the lower limbs.

At the age of 18 she already has two children. Her husband and her in-laws supported her in going to Ixchen Matagalpa to receive treatment because the biopsy reported a moderate cervical lesion, and as she herself says,
'... they gave me a cleaning...'

The benefit of receiving treatment free of charge in September of the same year was accompanied by friendly care. The following month, at her post-treatment check-up appointment, it was found that everything had come out well. This calmed Oyanka and made her feel she had been cured. She is aware of the importance of looking after her health:
'I think looking after it is important, because if we don't take care of ourselves no one is going to do it for us.'

Nevertheless, in August 2008 she returned to Ixchen for her check-up Pap smear, but thereafter missed her appointment to learn the result – she never knew the result of her check-up examination. Had she gone she would have known that the good news continued, in that her cervix showed no malignant cells. Oyanka says she did not intend to collect her result.
'...because the doctor had already told me that everything was fine...I was careless and didn't keep going.'

However, more than two years passed before Oyanka took the right decision to have a check-up Pap smear performed at the health centre in her community. She is waiting for the result to arrive.
The advice she would give other women who have not had a Pap smear:
'Well, I only recommend having it done because sometimes one trusts the husband, but then...'

In her community, people do not speak openly about cervical cancer:
'...it's that the people here, things are private, they don't go around talking...'

Her greatest concern is payment for the examinations women have to undergo.
'See, I recommend that they should help women, because they are not able to pay for an examination since in Ixchen everything is paid for and, thank God, they helped me do things free of charge, because if not I would have had to pay.'

The partner is also part of the problem and of the solution...

Julio has been living together with Oyanka for seven years, they take decisions together. Permission to go to the health centre is not an issue between them, but communication is; he says that being together is also a commitment:
'No, we are only together, in other words, as they say, we're together, but we're in a relationship, a normal one, like married people.'

His work as a motor vehicle mechanic helps him maintain his small family of two children. Julio thinks it is good for the woman to take care of herself, but was sorry to hear that Oyanka had a disease. He knows that the man brings problems home which affect the woman's health. He values using of a condom.
'In principle, always the condom, but you know that the health of a woman, yes, you know that sometimes someone, like I say, brings his problems and one doesn't know, you know, what type of problem one is bringing, and so one always uses a condom, above everything.'

His parents' support encouraged both of them to seek treatment for Oyanka

According to Julio his parents supported them:
'My father's quite old ... but after something like a month and a half my mother came and took care of the girl (...) I didn't have more family, here, nearby, so we couldn't count on anyone else, but thanks to God I was able to solve it from here and we went ahead.'

If Oyanka's result would again prove to be positive, Julio knows what he has to do:
'Ummm...in fact a little while ago she actually went to do this Pap, but it has not come back. Depending on what comes out, in any case, we're going to have to seek treatment.'

As Oyanka's partner and the couple's communication, he learned from her about the care at Ixchen.
'Ummm...a very good care. Yes, good because they took good care of her, they gave her treatment, they gave her the opportunity to keep going there.'

Comparison of the survey's treatment chain with the Ixchen data

In order to understand the treatment chain from the totality of data from the Ixchen programme, a comparison was made between the chain reconstructed from the survey and the Ixchen database on the 4,432 women with positive diagnoses, specifying the number of women with positive diagnoses who were detected solely by the mobile units (2,211 women) and not those who were referred by MINSA or other facilities (2,251 women).[90]

[90] This distinction was made in the light of the cost-effectiveness study, in which a classification was made of the diagnoses conducted and their referral sources. The data were obtained from the databases on women with positive diagnoses provided by Ixchen.

Annex L (CD-ROM) gives the corresponding data, and we conclude that the treatment chain data reconstructed on the basis of the survey are reasonably comparable with the Ixchen database. This is important for what follows below.

Continuation of or defaulting on the treatment chain

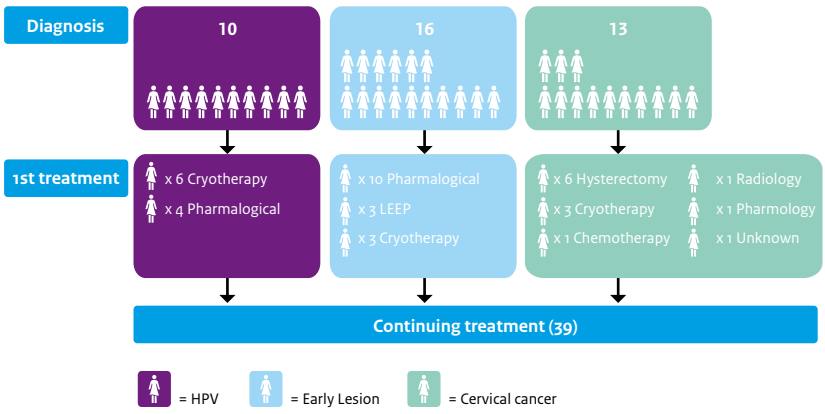
As already noted in the treatment chain, of the data compiled by the survey a total of 27 women were discharged from the programme, representing 46% of the 59 women with a positive diagnosis surveyed. Similarly, 3% of the cases did not attend any stage of the treatment chain, and 37% dropped out of treatment at some point.

Defaulting in the middle of the treatment chain: according to the reconstruction of the treatment chain, 18 women dropped out of the chain after the first treatment (30%) and 4 at the end (7%). For the first drop-out phase, it is known that generally, when the first treatment was completed the women were referred for a check-up appointment. Defaulting in this case resulted specifically from failure to attend the check-up appointment after the first treatment.

Apparently, the main reason for defaulting at this stage was not having received a check-up appointment (12 of the 18 women); nevertheless, given that this is a matter of the client's perception, assuming this as a reason for drop-out would introduce a bias. In figures 5.9 and 5.10, the groups of women were divided by (perceived) type of diagnosis and treatment, to verify whether there was any relationship between the type of treatment received and the fact of continuing the treatment or not.

This relationship may be important, since every treatment may be longer or shorter in duration or more invasive than another, and this could be decisive as regards the decision whether or not to go ahead with the treatment chain.

Figure 5.9 *Women who continued with the treatment chain by type of diagnosis and treatment*

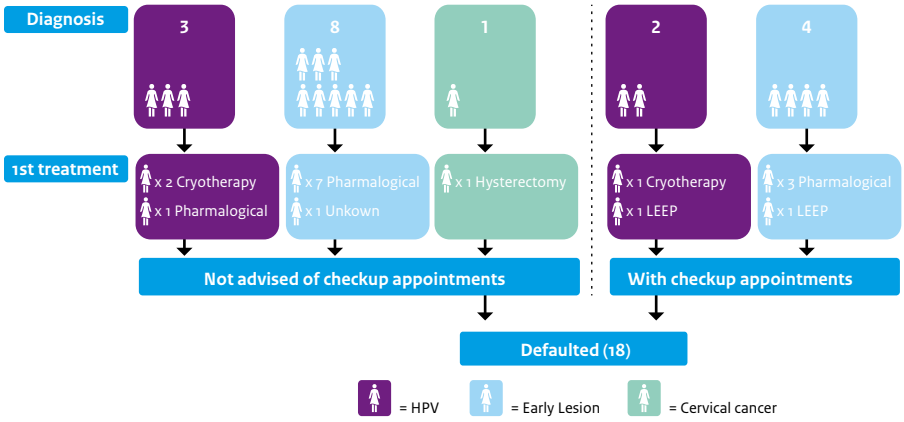


Source: Drawn up by the authors using data from the CDR–Ixchen survey (2011).

Figure 5.9 classifies by diagnosis and treatment received the women who continued with the treatment chain (39 women) after first treatment. It can be seen from these cases that 29 women were diagnosed (according to their perception) with early lesions and cervical cancer, while 10 women said they had HPV. Regarding the treatment received, 15 women said they had received pharmacological treatment (38% of 39 cases), 12 said they had received cryotherapy (31%) and 6 that they had been given a hysterectomy (15%).

Given these figures, apparently the women who continued in the chain had less invasive treatments which took up less of their time. In other words, pharmacological treatment, while it entails responsibility and discipline to take medicine at specified times over a specified period, does not involve the women spending long periods of time outside their homes. It should be stressed that of the 39 women who continued with the chain, 30% had children aged between 0 and 6 in the home; this is an important reason for staying at home and for a treatment not involving travel to be the most popular.

Figure 5.10 *Women who defaulted the treatment chain, by type of diagnosis and treatment*



Source: Drawn up by the authors using data from the CDR-Ixchen survey (2011).

Figure 5.10 classifies by diagnosis and treatment received the women who did not continue in the treatment chain (18 women) after the first treatment, in other words those who did not keep the first check-up appointment. Of the 18 women, 12 said they had not been advised about a check-up appointment, and 6 said they had received a notice but had not attended. The reasons for not continuing at this stage among the women who did say they had been given a check-up appointment (6 women), or were told they should have a check-up Pap smear, and not attended, vary:
1) distance between their homes and the centre for conducting the check-up;
2) lack of people at home to leave the children with;
3) lack of money to travel to the place of the check-up;
4) lack of will to have the check-up (not wanting to);
5) the fact that Ixchen did not return to the community to conduct the check-up itself; and
6) because it was not yet time to conduct the check-up.

Of the 18 cases that did not continue treatment, 28% were diagnosed with HPV, 67% involved inflammations of the cervix or early lesions and only one woman said she had been diagnosed with cervical cancer. Regarding treatments received, 61% of the treatments reported were pharmacological, almost all of them said to be for treatment of early lesions (only one case of HPV), while 17% of the woman said they had received cryotherapy treatment, which indicates that the lesions were not necessarily advanced, because the treatments are shorter (the women who did not continue with the treatment chain and did not keep a check-up appointment said their treatment had taken on average 60 days). Nevertheless, the women who continued treatment (in figure 5.9) also had non-invasive treatments which probably did not take much time; accordingly, in this case the probable reason for dropping out of the treatment chain might be related to the women's perception of their illness and its seriousness.

Even so, the main reason for defaulting apparently turns out to be not having a check-up appointment or not having been told that a Pap check-up is again needed. While this could be a gap, or biased responses by the participants in the study, it still gives an indication that it might be desirable to investigate in greater depth the reasons why a check-up appointment was not received, with the final result that the clients do not know the current status of their disease and default on a potentially necessary treatment.

Defaulting before the second treatment: in accordance with the treatment chain, after the check-up appointment 27 women were discharged, and 12 again indicated treatment after confirmation of their status. Of the 12 women who were prescribed further treatment, only 8 went for it, and 4 abandoned treatment at this stage. Of the women who did have treatment in this phase, half of them had pharmacological treatment, and the remainder more invasive treatments such as hysterectomy and cryotherapy, the latter being recommended for those women who had had pharmacological treatment in the first phase and exhibited HPV in their check-up Pap smear. The reasons for dropping out of treatment in this phase were not researched, since the women did not provide specific reasons for dropping out; only one of the cases was related to secondary effects of the first treatment (bleeding and pain), while for the other cases, the reasons are not known.

5.6 Public-private cooperation

Question 5: How effective has the intervention been in terms of formation and sustenance of public-private partnership?

The agreement

The original idea of developing a programme to respond to the challenges of the low Pap smear coverage in Nicaragua, the considerable number of cases of cervical cancer detected at an advanced stage and the existing limitations on the screening in rural areas was submitted by Ixchen in the framework of the efforts by the National Alliance for Cervical Cancer Prevention to link together efforts and opportunities. An agreement was drawn up between MINSA and Ixchen for the implementation of what was termed a sectoral

programme. The envisaged complementary roles of the participating entities were:

- ***Ixchen***: Implementer of the programme through the mobile units for screening and the treatment clinics for low-grade lesions. Ixchen was to coordinate with the Ministry of Health and the SILAIS on organising the mobile units' community visits to ensure that women were invited to attend. Ixchen would receive referrals of women from the MINSA services network for treatment of low-grade lesions and in turn arrange for referral of high-grade lesions to MINSA hospitals. And they would have a commitment to train health personnel in the new technical standards for prevention, screening and treatment of cervical cancer and transfer to them the SRHR-based work mode.
- ***Ministry of Health***: The Ministry would coordinate with Ixchen the community visits by the mobile units, in coordination with the SILAIS and the corresponding health centres and posts. The Ministry would refer clients of its static units with irregular Pap readings so that they would be offered complementary examinations and treatment through the sectoral programme, while at the same time receiving and treating in its hospitals the women referred by the Profamilia and Ixchen clinics. And the Ministry was to support the mobile units in the community visits, offering complementary services addressed to women and to boys and girls aged under five.
- ***Network of community health brigades:*** They would be responsible for mass outreach in the communities, as well as seeking out and promoting awareness among women who did not attempt to collect their results or dropped out of treatment at any stage in it. They would support the mobile units in home visits to women with positive results for cervical cancer.
- ***Nicaraguan Society of Obstetricians and Gynaecologists (SONIGOB):*** Responsible for initial training of the member organisations of the Alliance (including staff of MINSA/SILAIS, Ixchen and Profamilia) who would be responsible for conducting the screening and treating the lesions, on the basis of the technical rules for cervical cancer prevention, screening and treatment recently approved by the Ministry of Health.
- ***Profamilia:*** Through this network, Profamilia would provide treatment services for low-grade lesions to women requiring them at places where Ixchen lacked the capacity to fully meet demand.

Practice

As a result of the implementation of the programme, major advances in combating cervical cancer can be identified. Whilst not a direct objective of the programme, the intervention may have been instrumental in generating synergies among programme partners, creating awareness among decision makers and putting the theme on the public agenda. Among the most important developments are:

- Ministerial decree establishing the National Committee for Cancer Prevention and Control (December 2006)
- Opening of 13 early lesion treatment clinics in MINSA departmental hospitals (2009)
- Approval of the Protocol on Prevention of Cervical Cancer through screening with the Visual Inspection with Acetic Acid (VIA) and treatment with cryotherapy (2010)
- Drafting of the National Strategic Plan for Cancer Prevention and Control (2011)
- Conduct of national Pap smear days by MINSA, with the participation of Ixchen for reading the samples (2010–2011)

Coordination

According to the SILAIS personnel interviewed, the relationship between the programme and the various levels of care provided by MINSA was varied.

In SILAIS 1[91], it was indicated that the community visits were very well coordinated and that it was possible to arrange support by health facilities for the mobile units during the visits. Nevertheless at the organisational level the role of MINSA ended with the preparation of a visit; there were no feedback meetings and information on the services provided was not conveyed to the SILAIS personnel.

In SILAIS 2, coordination was described as very good since they participated from the commencement of the process, and periodic meetings were held between delegated personnel of Ixchen and the SILAIS. These meetings shared information on the provision of services by the mobile units and the Profamilia clinic for the women needing treatment after the Pap diagnosis, and planned the activities for the coming month.

Staff of SILAIS 3 said that they sometimes accompanied the visits, assisted in securing women's attendance and referred clients to the Ixchen clinic. They said they tried to hold coordination meetings but ultimately coordinated only with Ixchen, not with Profamilia and other actors. The transfer of women with invasive cancer to the departmental hospitals was conducted in accordance with what had been agreed.

Although coordination between the various SILAIS and Ixchen was thus not always strong at programme level, at service level this was quite good: MINSA's static units referred a considerable number of clients to Ixchen's mobile units, constituting half of all clients attended by Ixchen.The staff of Profamilia identified themselves as providers of services not closely linked to the programme, nor did they know that they were part of a strategy for reducing cervical cancer. They said they had not attended or been invited to feedback or evaluation meetings with Ixchen; the association apparently was more one of a commercial nature than one between partners.

The people comprising the network of health brigades and community leaders said that they had supported the sectoral programme by organising the community visits and supporting the search for women with altered results.
'Yes, I went there with them because one day we went looking for a lady who had turned out to have problems and we couldn't find her. That day I went with them to a community which is far away from here.' [Female community leader, La Dalia]

[91] The three SILAIS where staff was interviewed are anonymised in order to protect the confidential nature of the information received via interviews.

They identified the initiative as important for the women in their communities and reported that they were in contact both with the MINSA personnel serving their communities and with the mobile units of the sectoral programme.
'Well, they came here and were very friendly. The female doctor, those who were accompanying them, they had a very caring attitude to us women, and everything was very confidential, and it was very good.' [Female community leader, Dipilto]

The local authorities participated by supporting the mobilisation of the women who needed treatment outside their community. The support consisted of money for mobilisation and transport, among other things. Although local authority participation was not uniform, it constituted a solution for the women lacking the resources to travel.
'There's a small fund, we won't say it's exaggerated, but yes, a small fund was established for these very special cases, for example the case of the woman who was detected and is receiving chemotherapy in Masaya...' [Local authority, Dipilto]

Transfer of capacities

According to the MINSA informants, its personnel was not involved in performing Pap smears or in giving educational talks in the communities. Transfer of knowledge by Ixchen to MINSA health workers on a gender and human rights approach hardly took place, nor did the strengthening ofskills training for doing Pap smears, which was the responsibility of SONIGOB. In Ocotal and Matagalpa, the staff of the Ixchen mobile units reported a single training session on Pap smear techniques and advice for MINSA and Profamilia staff. Nevertheless, the teaching materials were used exclusively by the Ixchen mobile units and treatment clinics; they did not share them with the MINSA and Profamilia units.

A significant contribution by the sectoral programme was going to be the training sessions on technical standards for the MINSA primary network, in support of the National Strategic Plan. However, this was not provided uniformly in all SILAIS; one of them reported that there was no transfer or development of the capacities of its staff in the context of implementation of the programme.

Referral system

A data management system for the referral and counter-referral of women to and from the public services was not agreed on. In some cases the files on women treated by Profamilia were taken by Ixchen and no copies of them were left, nor were reports submitted to MINSA once the programme had been completed. This constituted a limitation on follow-up of the women in the public services, meaning that it was not possible to ensure a continuum of care, which is essential in order to achieve the proper quality of care.

'There was no transfer of the women's files or case histories. These remained in the clinics and the clinics are still in the territories. So each early lesion treatment clinic has the history, has the file on the women it has attended to. So the possibility of follow-up in the health facility, you're right, this didn't happen...' [Member of Ixchen national management]

Handling of information

In one of the SILAIS interviewed, they were able to incorporate in their statistics the care provided by the sectoral programme's mobile units and early lesion treatment clinics, but this was the product of local coordination; there was no overall coordination.

The handling of the clinical files was not standardised, with the result that the information recorded in them was variable, with information gaps important for follow-up on the women.

A database is essential in any programme for the prevention of cervical cancer. The one maintained by Ixchen was lost in an accident because there was no back-up system. Thereafter, only the information on the treated clients who had positive Pap results was re-incorporated; those with negative Pap results or no Pap are recorded only on paper. This was a limiting factor referred to by Ixchen regarding the transfer of that information to MINSA and also affected the present study.

5.7 Cost-effectiveness of the intervention

Question 6 How cost-effective has the intervention been in terms of cost per screening and cost per case detected?

To achieve the study's objective of analysing how cost-effective the intervention was in terms of costs per examination and costs per case detected under the programme implemented by Ixchen, the following steps were taken:

1. Analysis of costs and assignment of indirect and administrative costs to the different project components (Ixchen mobile units and early lesion treatment clinics (CLT); with a specification for the costs incurred for the education sub-component)
2. Calculation of the cost per examination and per case detected (with a specification of the education costs per examination)
3. Calculation of the average cost per case treated in the pre-cancerous lesion treatment clinics
4. Estimation of the number of life years saved on the basis of a detailed analysis of the project records, with a breakdown into (i) women who attended the mobile units and (ii) women who attended, and were referred by, the Ministry of Health
5. Estimate of total cost (screening and treatment) per life year saved
6. Identification of the other benefits associated with the project
7. Analysis of the cost-effectiveness of the various components of the intervention; comparison with other providers in Nicaragua, other strategies for preventing cervical cancer and other projects and programmes reported in the literature; comparison of the cost of life years saved with per capita gross domestic product (GDP).

Annex 4 gives the methodological details of the analysis and the calculations.

Costs

All costs included in the Netherlands budget as well as a contribution by UNFPA should be regarded as direct costs incurred specifically for the implementation of this project. Account also needs to be taken of the costs incurred by the women for the conduct of their Pap smear and visits to the CLT.

- For the Pap smear, 95% of the women had no out-of-pocket costs. The time required to visit the units was short, representing a cost of US$0.30 per woman; this opportunity cost is very low and was not included in the calculations.
- For treatment of those who had a positive Pap result, the women incurred out-of-pocket expenditures for transport, food and drugs averaging US$56. Adding the opportunity cost of US$1020, the total expenditure is US$66.20 per woman treated.

Cost per Pap smear

With certain assumptions regarding the use of the costs of the mobile units and laboratory costs, the cost per Pap smear is estimated at US$28 for the total number of women covered (66,521 Paps). However, taking into account only the additional number of Pap smears that can be attributed to the activities of the project (44,058 Paps = net effect, see section 5.2), the cost increases to US$43.

The total marginal costs[92] of the education sub-component are estimated to be US$2.57 per Pap smear, for the 66,521 Paps; this constitutes 9% of the total Pap smear cost of US$28.33.

Table 5.11 Cost per Pap smear

Category	Number of Paps	Cost per smear US$	Observations
Total women captured by the mobile units	66,521	28.33	Marginal cost for education-subcomponent, per Pap smear: 2.57 (9%)
Women captured by the mobile units who would not have had a Pap smear without the project	44,058	42.77	Average of the range identified by the quantitative study

Source: Drawn up by the authors.

Cost per woman detected as having cervical cancer

The project records indicate that a total of 4,432 women received treatment in the CLTs. The total includes 2,211 women brought in through the mobile units and 2,221 referred by other organisations, predominantly MINSA.

[92] The education-related marginal costs are estimated to be US$170,678 and only include those costs that were incurred specifically for the education sub-component (and would not have been incurred in absence of this sub-component). These include costs of staff that dedicated most of their time to education activities (US$123,885 for six social workers, who undertook community education activities and the educational sessions for clients seeking the services by the mobile team); while the remaining costs covered materials, equipment and the production of a dramatised radio series.

The women with a positive diagnosis included a range of diagnoses associated with cervical cancer, from HPV and low-grade lesions to invasive cancer. In the Ixchen programme, all the women with these diagnoses were referred to the CLTs in order to minimise the potential loss of women clients who might need treatment.[93]

The cost per woman with a positive diagnosis detected by the mobile units, including all diagnoses, whether or not associated with progression to cervical cancer, was US$852. If only women with diagnoses associated with cervical cancer are included, the cost rises to US$1,570. This figure reflects the high cost of capturing women in remote areas and the narrow range of services offered by the programme (which means that costs cannot be shared).

Table 5.12 Cost per woman with cervical cancer detected

Category	Cost per woman detected US$	Observations
All women captured by the mobile units and referred to the CLT	852	Does not include women captured by MINSA and referred to the CLTs
Women captured by the mobile units with a diagnosis associated with cervical cancer	1,570	Does not include women captured by MINSA and referred to the CLTs

Source: Drawn up by the authors. CLT = Early lesion treatment clinics.

Cost per woman treated

The project protocols were designed to minimise losses of women who might need treatment, taking into account the difficulty of access by women to the CLTs.

The table shows the costs per woman treated (i) taking into account only the cost of treatment in the CLTs; and (ii) including all project costs. The data are broken down by source (mobile units and all sources) and by type of diagnosis (directly associated with cervical cancer or not). The table indicates that the cost of treatment in itself is relatively low, the majority of the project costs having been incurred for the fitting out and operation of the mobile units.

93 In static clinical programmes and programmes where client access is easy, the majority of women with 'light' diagnoses do not receive immediate treatment, but are subject to monitoring.

Table 5.13 Costs per woman treated				
Category	**Number of women**	**Cost of CLT per woman treated US$**	**Total cost of the project per woman treated US$**	**Comments**
All diagnoses				
Captured by the mobile units	2,211	173	1,026	Does not include the cost to the women, owing to lack of data for the cases which were not cervical cancer
Captured by the mobile units, MINSA and other organisations	4,432	87	512	Does not include the cost to the women, owing to lack of data for the cases which were not cervical cancer
Diagnoses related to cervical cancer				
Captured by the mobile units	1,200	385	1,956	Includes the cost to the women
Captured by the mobile units, MINSA and other organisations	2,667	210	916	Includes the cost to the women

Source: Ixchen records. (CLT = Early lesion treatment clinic)

Cost per life year saved

The cost per life year saved is the parameter normally used in cost-effectiveness studies to compare strategies and interventions and to evaluate their costs in comparison with a static parameter.[94] WHO[95] recommends comparing the cost per life year saved with per capita gross domestic product (GDP); any intervention with a cost per life saved lower than this figure is regarded as cost-effective. The average per capita GDP in Nicaragua during the period covered by the project was US$994.[96]

To calculate the cost per life year saved in this programme, we took as the basis the number of life years saved previously calculated, with a reference calculation of the minimum and maximum life years saved (section 5.5). On the basis and of the known costs, the results are those shown in table 5.14; all of them are below the indicated average GDP.

94 Goldie et al. 2005, Sherris et al. 2009.
95 WHO 2001.
96 Data from the Central Bank of Nicaragua.

Table 5.14 Cost per life year saved, taking the age of the women into account

Category	Cost per life year saved, including only women attending mobile units		Cost per life year saved, including all women attending the mobile units, MINSA and other organisations
Total programme cost (to the donor) (A)		US$2,267,979	
Costs incurred per woman who received treatment (average for transport, drugs, food and time)		US$66	
Women's costs per life year saved (B) (based on an average of 29 years per woman treated)		US$2.27	
Scenario 1 – Minimum cost			
Number of life years saved (maximum) (C)	23,323		42,683
Cost of programme per life year saved (A/C=D)	US$97.24		US$53.14
Minimum cost per life year saved (D+B)	100		55
Scenario 2 – Maximum cost			
Number of life years saved (minimum) (E)	6,556		12,500
Cost of programme per life year saved (A/E=F)	US$345.94		US$181.44
Maximum cost per life year saved (F+C)	**348**		**184**

Source: Drawn up by the authors.

It is important to distinguish between the results for the women treated by the mobile units and the total number of women treated, of whom more than half were referred by MINSA and other organisations. The total cost-effectiveness of the project increases substantially if we include them all, because the number of women cared for in the CLTs is doubled without incurring further costs for uptake through the mobile units.

Comparison with the cost-effectiveness of other providers in Nicaragua

The recent study by Alvarado and Martínez Granera (2010) compared the cost-effectiveness of various Pap-screening programmes in Nicaragua over the period 2000-2010. The results cannot be compared directly with this study, among other things because the authors assume that each woman treated has a survival time of 20 years, with no breakdown by age of those treated or the type of diagnosis.

Table 5.15 shows Alvarado's results and ours. To facilitate the comparison, we apply the 20-year survival to our data on life saved by mobile units, giving a minimum cost per life years saved of US$149 and a maximum of US$531.[97]

The variation in cost-effectiveness of the different interventions is due in part to the differences in types of cost included. Nevertheless, it is noteworthy that the projects of organisations such as ICAS and Ixchen, which target hard-to-reach groups and use a large part of their project resources to reach the women concerned, are less cost-effective than those working with more accessible groups.

Table 5.15 Comparison of the cost-effectiveness of the various programmes in Nicaragua

Organisation	Cost per woman treated US$	Cost per life year saved, US$	Comments
MINSA	75	4	CLT financed by UNFPA; costs do not include securing women's attendance or Pap.
Cultivando la salud	321	19	Small project, only the NGO's costs are included.
ICAS	1,558	91	Bond-financed project, does not include establishment costs.
Ortiz Gurdián Foundation	982	58	
Ixchen mobile units: Results of the study by Alvarado and Martínez Granera	1,146	57	In this intervention, neither direct costs of MINSA, Profamilia and other partners nor indirect costs borne by patients are considered. No account is taken of different diagnoses, assuming all represent lives saved.
Ixchen mobile units: Results of this cost-effectiveness analysis	1,026	149 – 531	Includes only women, attending the mobile units, the calculation being based on an average of 20 life years saved. Includes only diagnoses directly related to the progression towards cervical cancer. Includes the women's own costs.

Source: Drawn up by the authors.

The evaluation of the cost-effectiveness of providing services to hard-to-reach groups represents only part of the assessment of projects of this type, whose additional benefits for women and their families in remote and isolated communities are extensive, but difficult to measure in quantitative terms.

At the international level there are a number of studies of the cost-effectiveness of different cervical cancer screening and treatment measures. They cannot be compared directly with

[97] These figures are higher because our original calculation based on the age profile of the women and average life expectancy gives a longer average survival time, and accordingly a lower cost per life year saved.

the results of our analysis because of differences in methodology and approaches.

One of the most relevant studies for us is Goldie et al. (2005), which compares the cost-effectiveness of eight cervical cancer screening and treatment strategies in five countries (India, Kenya, Thailand, South Africa and Peru). Its objective was to identify what combination of method and screening frequency was most cost-effective in terms of cost per life year saved. Although there are major differences in the level of costs among the five countries, Pap screening is shown to be less cost-effective than VIA in all the countries studied, and in all screening frequency scenarios. The medical service cost for each screening method does not vary much between countries, but the cost of transport and time for women clients does differ, and represents a significant percentage of the total. In the Ixchen project, the cost of transport is also considerable, but it is practically all covered by the programme.

The results of Goldie et al. show that in all countries the best cost-effectiveness corresponds to a strategy of a single screening during the woman's life using VIA, followed by a DNA sample of HPV once in the woman's life. Calculations of the cost per life year saved of the most cost-effective strategy in each country as a percentage of per capita GDP range from less than 1% in India to 13% in Kenya, which is the country most comparable with Nicaragua in terms of cost level and per capita GDP. Our calculations of cost per life year saved in the most optimistic scenario (scenario 1 in table 5.14) fall within this range, despite the fact that the Pap smear is less cost-effective than VIA.

"Cervical cancer laboratory", at Ixchen clinic, 2010, Esther Jurgens/ETC Crystal

6 Discussion and conclusions

The present report has analysed the impact of the sectoral cervical cancer screening and treatment programme conducted by the Ixchen Women's Centre jointly with MINSA on behaviour in seeking and using health services by the Nicaraguan women clients of the programme. On the basis of a mixed method study, combining quantitative and qualitative methods, an analysis was been made specifically of the scope of coverage of the services provided by the Ixchen mobile units and the related treatment, together with the factors influencing it; the changes in women's awareness regarding cervical cancer and other aspects of SRH; the use of other SRH services; the progress and challenges regarding public-private programme collaboration; and various aspects of the cost-effectiveness of the intervention.

The following sections discuss in greater depth the results presented; this discussion was already initiated in the preceding chapter, and arrives at conclusions to answer the research questions posed.

6.1 Screening for cervical cancer

Question 1 What is the effect of the intervention in terms of coverage (number of people screened for cervical cancer) compared to the without-intervention situation? What are the main factors that explain the coverage of the intervention?

It may be said with 90% confidence that the net effect of the intervention with regard to Papanicolaou coverage was between 42,000 and 46,000 cases. This effect was corroborated by constructing a situation in which the programme's intervention was absent (counterfactual situation). The total number of cervical cytologies conducted by the Ixchen programme amounts to more than 66,000 cases. Of this total, the net effect of the intervention accounts for between 63% and 69% of the estimated total between 2006 and 2008.

As a complementary measure, it was decided to work on the analysis of medium-term impacts, which had important advantages at the time the survey was conducted, but represents a series of challenges when analysing the results. Nevertheless, in this report it has been possible to establish the positive effect the Ixchen mobile units programme has had on coverage. While coverage, defined as the percentage of women who had a Pap smear conducted within a three-year period, is low, it reveals the importance of Ixchen in increasing this coverage. This effect is obvious and important, and is shown by the women who are in contact with the services.

In the years before the first phase of the Ixchen programme – before 2006 – significantly lower coverage rates (between 6% and 12%) are found than in the period after the intervention, from 2009 onwards (between 21% and 26%). Nevertheless, this is an apparent effect, bearing in mind that other initiatives under way in the intervention areas were not analysed.

By means of the complementary analysis conducted using the probit model, it was additionally established that awareness of sexual and reproductive health (in this case,

family planning) is a key factor explaining the demand for reproductive health services by women. Ixchen assisted in this process, although apparently it did not reach all women. Along these lines, while no significant impact of the Ixchen educational talks was shown, it cannot be completely ruled out that methodologies of this type are of significance in generating awareness. The importance of the women's educational level is also established. Access to education, a key to many other aspects of life, is also extremely significant with respect to awareness of the importance of reproductive health check-ups.

In addition, a positive relationship was found between pregnancy and demand for Pap smears. In other words, pregnancy increases the probability of having a Pap smear, but the study also shows, on the other hand, that having small children significantly decreases the probability of having a Pap smear. It appears that small children constitute a barrier to access health services, since they need someone to take care of them while their mother goes to the health service, unless she takes them with her, which generates additional costs. This is an important finding in the Nicaraguan context, given the very high proportion of families with children under 6 years of age.

It is noteworthy that partner support apparently has no significant impact on women's decision to have (or continue having) Pap smears. This is explained in part by the fact that the women interviewed stated that it was they who decided when and where to go for health services. Although the same women expressed fairly traditional views on the division of gender roles, this shows greater openness of the women to more autonomous decision-making with regard to their SRH. Nevertheless, it will have to be considered that the group that was able to get out of the house and go to have a Pap smear done might well have different characteristics from the women who did not go; in other words, those who did not go perhaps did not have or feel that they had this 'autonomy of decision'. That would explain why it is only professionals and community leaders (not the women) who refer to problems of ***machismo*** and jealousy inhibiting women's access to the services for Pap smears and treatment. This would be worth looking at in depth in future studies.

There is some, although little, evidence that the women who indicated high levels of satisfaction with the Ixchen mobile units programme have more probability of continuing to seek reproductive health services in the future. With respect to this satisfaction, the quantitative study verified that the majority of clients rated the services received from Ixchen as very good or excellent. This was confirmed by the qualitative interviews, which indicated as a main reason the fact that the staff providing care were women and from outside the community. Other important aspects were privacy and confidentiality: while the majority of the women were in agreement, others indicated lack of privacy during the taking of the Pap sample and lack of confidentiality with respect to delivery of the Pap smear results (they did not arrive or there was a perception of disclosure of the result in the community).

Although the programme sought to use a rights and gender-based approach, it appears that the high demand and the targets set affected the quality of care using this approach, in that a not inconsiderable number of women (one out of every seven) in the sample said that they

had not received sufficient information during the examination: there had not always been sufficient time or space to ask questions.

6.2 Knowledge and attitudes regarding cervical cancer and other aspects of sexual and reproductive health

Question 2 What is the effect of the intervention in terms of awareness and attitudes to cervical cancer and other SRH issues?

The results of the qualitative study indicate limited knowledge of Pap smears (frequency of examination, place and procedure for taking the sample) and cervical cancer (causes),. In addition, women who were Ixchen clients had no better knowledge than non-clients; this suggests that the methodology Ixchen employed did not have the desired effect regarding increased awareness and knowledge on SRH topics, including cervical cancer. The limited scope for asking questions during the examination itself, as observed by some women, may have been a missed opportunity. It is valid to acknowledge that even though the sectoral programme implemented by Ixchen aimed to improve the knowledge and attitudes of women in the communities, the activities undertakento achieve this objective were insufficient. This is also apparent from the clients' indication that the visits of Ixchen mobile units did not provide them with new or additional knowledge on Pap smears and cervical cancer but already existed before , deriving from various sources. Another indication of the limited effect of this aspect is the fact that the probit model was unable to find a significant impact of the education talks on having a Pap smear done.

With regard to other SRH services: almost a quarter received them in an Ixchen unit, which is a significant and important fact. It is also noteworthy that a large portion of the women aged over 36 had their first SRH service (apart from the Pap smear) more or less during the period of the Ixchen intervention. Apparently, for this group the first Pap led to the use of other SRH services.

There is a low level of openness to talking about SRH topics in the home, something which is directly linked to the specific context of these women in low-resource situations and with low levels of education, and to the overall context of Nicaragua, where the church, in its different denominations, probably also has an influence, which largely explains the taboos associated with SRH topics.

Lastly, the programme implemented by Ixchen was important in bringing some groups of women into contact with SRH services, but there is very little effect in terms of generating knowledge of cervical cancer and other aspects of SRHR. At the same time, there exist major prejudices which need to be dealt with.

Issues for the future

Sometimes the objectives of programmes in terms of coverage are at odds with the simultaneous ambition to provide better quality of care; this tension is worth reflecting on. This issue is also related to the concern to try and offer every woman the opportunity to seek and acquire sufficient information for an informed decision on services, procedures, results and possible treatments. The quantative part of the impact study did not look into the knowledge levels of non-clients, thereby making it difficult it ascertain the specifics of the approach taken and its effect on increased knowledge.

More generally, there is a need to look into how to generate greater knowledge and awareness of cervical cancer and other aspects of sexual and reproductive health and rights in the communities, employing a gender approach and thus overcoming socio-cultural barriers that prevent women from going for a Pap smear. Given the lack of clarity regarding the role of the partner in women's access to prevention and treatment services, it is worthwhile exploring these dynamics in greater depth. At the same time, it is important to include men in awareness promotion regarding various aspects of SRHR, including cervical cancer.

An effort could also be made to follow up on clients' comments on the need to have female staff providing the Pap smear and gynaecological services in the public sector, to the extent possible, and in addition on achieving greater privacy and confidentiality and humane treatment.

In general, community leaders, both men and women, could play a key role in supporting the educational activities conducted in the communities, in coordination with the MINSA services and other local actors. This could improve continuity and the effectiveness of the educational activities on SRH and cervical cancer prevention.

6.3 Use of other sexual and reproductive health services

Question 3 What is the effect of the intervention on the target group's use of other SRH services in the public, private and NGO sectors?

It was found that the vast majority of women with unfavourable diagnoses and a little over half of the women with a negative Pap result asked for other SRH services, above all Pap smears and gynaecological consultations. For some of them (those who had not been accustomed to having a Pap prior to the Ixchen programme), this reflects a need created by the intervention. The fact that these services were sought predominantly in public health facilities is also important in view of the cooperation between the public and NGO sectors in connection with the programme.

It is important to note that the health personnel who participated in the qualitative study also noted a change in behaviour on the part of many women, in that they became more active in seeking out SRH services. It is interesting to note that having income from employment has virtually no influence on this demand – even though the service itself is free of charge, there are associated costs (e.g., drugs, transport) and opportunity costs (time).

6.4 Treatment for cervical cancer

Question 4 What is the effect of the intervention in terms of number of people correctly treated (discharged) for cervical cancer compared to the without-intervention situation? What are the main factors that explain (start and continuation of) treatment and drop-out ratios?

From the net effect on Pap smear coverage, it is deduced that between 500 and 1,200 'extra' women were treated as a net effect of the programme. In addition, it was calculated that a total of between 6,600 and 42,700 life years were saved as a result of the programme. These are significant impacts attributed in full (Pap smears) or partly (life years saved) to the programme.

Almost a sixth of the women in the sample indicated that they had not received adequate information on their diagnosis and treatment. In addition, a considerable emotional impact on the women with an unfavourable diagnosis was apparent, regardless of whether the programme offered greater support, e.g., counselling.

Factors conducive to the initiation and completion of the prescribed treatment were obtaining clear information, the fact that the service was free of charge, having someone with whom to leave the children and being able to rely on financial support. In addition, the decision to commence and continue treatment could be explained in part by the information the women received regarding the seriousness of their medical condition and the consequences of not treating it in time, and on the other hand by the possibility of resolving the issue of care of small children and the resources needed for travel and buying medicine.

However, there were a number of barriers to the women with a positive diagnosis commencing their treatment, including fear, absence of care for the children and lack of money to pay the costs associated with the treatment. It is also important to recall that the women interviewed did not exhibit knowledge of their exact diagnosis, its severity and the real risk entailed; likewise, they did not know the type of treatment they received and its effect.

These are factors that could be considered with a view to improving levels of completion of treatment. For 60% of all women diagnosed as positive, it remains unknown whether they completed their treatment; they dropped out of the diagnosis and treatment chain service records for want of an adequate follow-up and monitoring system.

For the women clients, service records show a high percentage of drop-outs in the middle of the treatment chain, even higher than at the end of the chain. It may be inferred that there is a relationship between (i) dropping-out before the second phase of treatment and after the first check-up appointment or referral for a check-up Pap smear and (ii) receiving or not receiving instructions to have a check-up performed once the treatment was finalised; nevertheless, this cannot be verified, at least not with available data. Even so, this deficiency, apparently insignificant, may have cost the lives of women who did not verify their status – whether they could be discharged or not – at the end of one phase of treatment.

Our cost-effectiveness calculations included an estimate of maximum life years saved on the assumption that all women classified as not attending, transferred (with no further data) and pending were cured. In practice, the proportion was probably considerably less. Better follow-up of the women, however difficult it might have been, would have increased the number of women confirmed as discharged and hence the real cost-effectiveness of the programme.

The data on gender relations show a discrepancy between the views of the female clients and the health service providers on the issue of seeking services. Women clients said they themselves decide when and where to seek health services. Some of the personnel of the health services and of organisations involved in the sectoral programmeindicated male jealousy and ***machismo*** as important reasons women did not seek or discontinued treatment. In addition, knowing that the condition was curable appeared an important element in women's motivation. All these aspects lead one to believe that greater staff support for clients would help ensure a higher treatment completion rate. This in turn requires a stronger administrative system and database than those used by Ixchen during the intervention.

Issues for the future

Prevention and treatment programmes for cervical cancer require registration discipline and improved data compilation and management systems. These would complement the procedures relating to referral and counter-referral of clients. Strengthening of the referral system itself, including referral between public and private (NGO) partners, would be key. Greater investment in these systems is needed to ensure continuity of care and appropriate follow-up.

6.5 Public-private cooperation

Question 5 How effective has the intervention been in terms of formation and sustenance of public-private partnership?

The initiative of establishing a programme based on cooperation between the public and NGO sectors was appropriate given the nature of the problem, which affects a large part of Nicaragua's population, and the fact that tthe topic of cervical cancer is not controversial in comparison with some other aspects of SRHR.

Moreover, the sectoral programme emerged from a joint intersectoral effort to seek synergy. At the policy level there was a certain indirect synergy in how the programme and the cooperation contributed to decision-making on cervical cancer priorities and to the creation ofpolicies, protocols and programmes.

In the field, the added value of the mobile clinic model and the early lesion treatment clinics in the departments lies partly in the fact that both approaches broke the barrier of geographical access to diagnosis and treatment of hard-to-reach women, as compared to

static services. It is important to point out that around half the women sent to the early lesion treatment clinics for confirmation of their diagnosis and commencement of treatment were captured and referred to Ixchen by the MINSA static services.

The roles of the most important partners thus were complementary and synergies were achieved to some extent, Nevertheless, the failure to involve MINSA personnel actively in adopting the rights-based approach and taking part in educational and Pap screening activities was a missed opportunity for transfering skills.

Programme coordination at national level was virtually non-existent.In the SILAIS, coordination at service-level was mostly good while programme coordination was less consistent. The referral system data management was weak overall. .It would be easy to reap the benefits of a better coordinated effort, which at the same time would offer clients greater continuity of care and respect for their rights.

Issues for the future

The added value of ongoing cooperation between the various stakeholders at national and local levels could be evaluated so as to permit further development and coordination of activities among all stakeholders in the area of cervical cancer. Within the framework of this kind of cooperation, municipal authorities, local organisations and community leaders could look at strategies for overcoming key barriers preventing woment to access prevention and treatment services, such as psycho-social counselling, associated costs (transport, drugs) and care for small children.

In addition, with the participation of all actors involved, a cervical cancer screening and treatment monitoring and evaluation plan could be defined in order to also incorporate data from non-governmental programmes into the departmental and national databases as compiled and monitored by MINSA.

6.6 Cost-effectiveness of the intervention

Question 6 How cost-effective has the intervention been in terms of cost per screening and cost per case detected?

Various methods exist for detecting cervical cancer, including Pap screenings, visual inspection with acetic acid (VIA) and DNA examination for HPV (DNA/HPV). There are different treatment strategies which may or may not be applied at the same visit as the screening. There are also different strategies for selecting women for screening.[98]

Analysis of the cost-effectiveness of different cervical cancer screening and treatment strategies in low-income categories reported in the literature indicates that:

[98] Sherris et al. 2009.

a. The most cost-effective methods are those requiring fewer visits. By this standard VIA with cryotherapy (in a single visit) is the most cost-effective.

VIA has numerous advantages over Pap smear in places for which access is difficult and in countries with low resource levels. When this project was implemented, MINSA did not have a protocol for VIA, and it was not regarded as a feasible alternative. Since MINSA now has a protocol for VIA and the Ministry and the organisations working in association with the Ministry can use it, it would be desirable to consider it as an alternative in future extensions of the programme.

b. Screening of women in specific age ranges (above 30) appears the most cost-effective..

The Ixchen programme targeted a population with high epidemiological risk (low-income rural women, women who had not taken a Pap smear before or who had not taken a Pap smear in the past two years), although care was also provided for lower-risk urban groups. The project was not addressed specifically to women in the age groups at greater risk of cervical cancer, nor to age groups that would make the programme more cost-effective.[99] Although the strategy employed in the project was not the most cost-effective, it would have been difficult and potentially counterproductive not to take an inclusive approach covering all women in the isolated rural communities served.

c. A programme is regarded as cost-effective if the cost per life year saved is less than GDP per capita.

Our results show that the programme was cost-effective, in that the cost per life year saved was lower than per capita GDP for the most pessimistic of our range of assumptions. Using our preferred results (which take the women's age and the diagnoses into account), the minimum cost per life year saved is US$55 and the maximum US$348. Average per capita GDP in Nicaragua over the period of the project was US$994, almost three times our maximum figure and 20 times higher than the minimum figure.

A comparison of the cost-effectiveness of eight screening strategies in five different countries (India, Thailand, Kenya, Peru and South Africa)[100] calculated a range of costs per life year saved of between US$10 in India and US$1,093 in South Africa, the VIA and DNA/HPV strategies being the most cost-effective. The study concluded that there is no universal criterion for measuring cost-effectiveness, and that the WHO criterion (cost per life year saved less than per capita GDP of the country) is the best indicator of cost-effectiveness.

The cost-effectiveness of the project is very good according to the WHO criterion.

[99] As described earlier, WHO recommends that countries base their priority target groups for cervical cancer screening on the national epidemiology for age-related incidence of invasive cervical cancer; which usually means a focus on age 30 and above (WHO 2002, 2006). Meanwhile, However, MINSA's 2006 guideline doesn't seem to reflect these recommendations yet as it defines the cervical cancer screening target group as 21-65 years; it also stipulates a higher screening frequency than recommended by WHO.

[100] Goldie et al. 2005.

The cost-effective analysis of the project indicates a cost per life year saved that is relatively high in comparison with other actions for the screening and prevention of cervical cancer both within and outside Nicaragua. This result should not be surprising, because of:

- the cost of reaching remote rural areas, which was largely borne by the project; and
- the technology and strategy selected for the intervention, namely Pap screening and subsequent treatment, which is less effective and more expensive than VIA with cryotherapy in a single visit.

The analysis indicates that the main cost of the project was the cost of securing the women's attendance at the mobile units (US$1,570 per case detected with a diagnosis relating to cervical cancer).

The cost-effectiveness analysis gives important guidelines for the design of future projects and/or the extension of this same programme. The cost-effectiveness figures improve considerably when, in addition to the women attending the mobile units themselves, we include the life years saved for the women attending MINSA and treated in the CLTs. This result is an important quantitative demonstration of the advantages of cooperation between the public and NGO sectors. We have not calculated the cost-effectiveness of the services MINSA was able to bring to the communities through the mobile units, but the types of services they conducted were among the most cost-effective in terms of life years saved (vaccinations, prenatal checks, family planning, etc.), and if we add these life years saved the project as a whole would show much greater cost-effectiveness.

These internal comparisons of the project's cost-effectiveness could be more beneficial for improving the design of the project than external comparisons with programmes that use different strategies and whose cost-effectiveness analyses are based on different assumptions. The internal cost-effectiveness comparison clearly shows the advantage of MINSA-NGO cooperation in terms of:

- better level of utilisation of the infrastructure and services provided by the project;
- improvement in cost-effectiveness when a mobile project offers a broader range of services; and
- significance of the out-of-pocket expenditures for low-income rural women.

The Ixchen Women's Centre and MINSA could make use of this quantitative demonstration of the advantages of cooperation to promote further coordinated intervention among the various sectors.

For any expansion or extension of this programme it would be important to take into account the cost-effectiveness results of screening programmes at the international level, above all the importance of selecting the most appropriate screening method for the area, taking into account the advantages in rural areas of combining screening and treatment in a single visit. . For a more targeted age-range, Ixchen may support itself in the 2010 VIA protocol which MINSA established specifically for women in communities where access to health care is difficult and in which it defines as target group women aged 30-50.

Another benefit of this programme was the better access to other SRH services – the women clients had no access to other Ixchen medical services through this project because the mobile units were providing only Pap smear services and educational activities directly related to the screening. Nevertheless, there was access to other MINSA services when MINSA personnel accompanied the mobile unit, taking advantage of the availability of transport for staff and equipment. The MINSA personnel offered other mother and child health services, thus increasing the women's access without increasing costs.[101]

Issues for the future

It is important to maintain the enthusiasm for continuing to base the prevention and treatment strategies on evidence, in order to achieve greater impact and greater cost-effectiveness. One point that requires attention is how to apply the protocol approved by MINSA for the VIA and cryotherapy strategy (single-visit approach), on a broader scale, inter alia so as to 'lose' less clients in comparison with a strategy involving a number of appointments and visits. Consideration could also be given to whether it is relevant to place greater emphasis on directing the screening towards women aged 30 and 50 and expanding the range of services offered through the mobile units.

The results of the present study could be used to demonstrate the impact and cost-effectiveness of the intervention in a priority population: low-resource women in hard-to-reach communities.

6.7 Unexpected impacts of the intervention

Question 7 What are important unexpected effects of the intervention?

One of the most surprising results was that the women clients regarded the sectoral mobile-unit programme as an alternative to the traditional provision of static health services by MINSA, and not as a joint effort between the two entities. Given that many women felt more comfortable with the service provided by the programme, for reasons that have been described, many prefer to wait for the mobile units to return to their communities instead of visiting the static service network of MINSA, for example to have their next Pap smear.

In addition, it is apparent that the referral and counter-referral system between the areas, units and health service levels of MINSA, Ixchen and Profamilia was not very strong. Many women who were discharged by the programme conducted by Ixchen were not counter-referred to their usual health facilities. In addition, they were not given an '***epicrisis***' (clinical summary) indicating in detail what was their diagnosis, the treatment provided and

[101] The additional costs of providing these services were paid by MINSA and are not included in the cost-effectiveness analysis.

post-discharge recommendations. This meant that the staff of the health facilities to which these women came requesting a routine check-up did not know this background in detail. This has two implications: (i) the MINSA staff may have had to start from zero in dealing with these women, leading to greater investment of resources; (ii) the women lost the possibility of having continuity of their care and the follow-up to their earlier diagnosis, which is an entitlement in accordance with the rules in force.

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Glossary

Biopsy	Procedure by means of which a tissue or cell sample is obtained for microscopic examination for diagnostic purposes (MINSA 2010)
Cervical conisation	Surgical procedure utilised for resection around intraepithelial lesion of the uterus with a depth of not less than 5 mm and containing all the transformation zone and union for the evaluation. Its function is diagnostic and/or therapeutic. (MINSA 2010)
Cervical cytology	Taking of a sample of endocervical and exocervical cells which are spread on a slide, fixed and treated with a stain known as Papanicolaou, in order to establish a diagnosis. It is one of the methods used to detect cervical cancer at an early stage. (MINSA 2010)
CIN – Cervical intraepithelial neoplasia	An abnormal precancerous growth of squamous cells in the uterus. Most cases of CIN remain stable or are eliminated by the individual's immune system without medical intervention. However, a small percentage of cases progress to cervical cancer. The main cause of CIN is a prior sexually transmitted infection, particularly the human papilloma virus (HPV). (Wikipedia) Depending on the damage to the cervical epithelium, CIN may be classified as I, II or III, with the higher number indicating greater damage.
Colposcopy	Diagnostic procedure using an optical magnifying device through which the vulva, vagina and cervix can be explored in the search for cellular alterations. (MINSA 2010)
Counterfactual analysis	The situation of what happened as a result of the intervention is compared with the situation that would have occurred without the intervention; it involves 'constructing' a 'counterfactual' in order to be able to compare it with the factual.
Cryotherapy	Treatment involving the application of a temperature lower than zero degrees centigrade for the purpose of reaching the freezing point of the cells, leading to cell death from cryo-necrosis. (MINSA 2010)
Dysplasia	Abnormality exhibiting loss of cell structure with alterations in the morphology of the cell components. (MINSA 2010)

HPV – Human papilloma virus	Sexually transmitted pathogen which belongs to the papova virus family; more than 70 types are known which infect the cells of the lower genital tract. It is of particular importance in the cervix because it can lead to gradual cellular changes which have been associated with the possibility of development of cervical cancer. (MINSA 2010)
Hysterectomy	Surgical intervention involving partial or total removal of the uterus, may be performed vaginally or abdominally. (MINSA 2010)
Impact assessment	Impact assessment attempts to answer the cause-effect question: what results are directly attributable to the intervention? This necessitates a counterfactual analysis.
LEEP	An outpatient surgical method involving cervical conisation using an electrosurgical instrument in which a low-frequency, low-voltage alternating current circulates through a fine wire electrode. (MINSA 2010)
Neoplasia	See CIN.
Net effect	The difference between (i) the result in the without-intervention situation and (ii) the intervention situation.
Pap – Papanicolaou	Cytological examination in which epithelial cell samples in the transition zone of the uterus are taken to look for cellular abnormalities which serve as a guide to (but do not diagnose) the presence of a possible cervical neoplasia. (Wikipedia)
Probit model	A probit model is a type of regression analysis in which the dependent variable may assume two values (0, 1) associated with the probability of occurrence of other independent variables.
RedCan4	Register of tumours at the hospital level (Nicaragua).
Screening	The term screening test applies to examinations employed to identify an apparently healthy population which is at greater risk of having a given disease that has not yet been diagnosed. (MINSA 2010)
VIA	Visual study method using acetic acid which is employed for early detection of neoplastic disease of the cervix. (MINSA 2010)

Annexes

Annex 1 About IOB

Objectives

The remit of the Policy and Operations Evaluation Department (IOB) is to increase insight into the implementation and effects of Dutch foreign policy. IOB meets the need for the independent evaluation of policy and operations in all the policy fields of the Homogenous Budget for International Cooperation (HGIS). IOB also advises on the planning and implementation of evaluations that are the responsibility of policy departments of the Ministry of Foreign Affairs and embassies of the Kingdom of the Netherlands.

Its evaluations enable the Minister of Foreign Affairs and the Minister for Development Cooperation to account to parliament for policy and the allocation of resources. In addition, the evaluations aim to derive lessons for the future. To this end, efforts are made to incorporate the findings of evaluations of the Ministry of Foreign Affairs' policy cycle. Evaluation reports are used to provide targeted feedback, with a view to improving the formulation and implementation of policy. Insight into the outcomes of implemented policies allows policymakers to devise measures that are more effective and focused.

Organisation and quality assurance

IOB has a staff of experienced evaluators and its own budget. When carrying out evaluations it calls on assistance from external experts with specialised knowledge of the topic under investigation. To monitor the quality of its evaluations IOB sets up a reference group for each evaluation, which includes not only external experts but also interested parties from within the ministry and other stakeholders. In addition, an Advisory Panel of four independent experts provides feedback and advice on the usefulness and use made of evaluations. The panel's reports are made publicly available and also address topics requested by the ministry or selected by the panel.

Programming of evaluations

IOB consults with the policy departments to draw up a ministry-wide evaluation programme. This rolling multi-annual programme is adjusted annually and included in the Explanatory Memorandum to the ministry's budget. IOB bears final responsibility for the programming of evaluations in development cooperation and advises on the programming of foreign policy evaluations. The themes for evaluation are arrived at in response to requests from parliament and from the ministry, or are selected because they are issues of societal concern. IOB actively coordinates its evaluation programming with that of other donors and development organisations.

Approach and methodology

Initially IOB's activities took the form of separate project evaluations for the Minister for Development Cooperation. Since 1985, evaluations have become more comprehensive, covering sectors, themes and countries. Moreover, since then, IOB's reports have been submitted to parliament, thus entering the public domain. The review of foreign policy and a reorganisation of the Ministry of Foreign Affairs in 1996 resulted in IOB's remit being

extended to cover the entire foreign policy of the Dutch government. In recent years it has extended its partnerships with similar departments in other countries, for instance through joint evaluations and evaluative activities undertaken under the auspices of the OECD-DAC Network on Development Evaluation.

IOB has continuously expanded its methodological repertoire. More emphasis is now given to robust impact evaluations implemented through an approach in which both quantitative and qualitative methods are applied. IOB also undertakes policy reviews as a type of evaluation. Finally, it conducts systematic reviews of available evaluative and research material relating to priority policy areas.

Annex 2 Details of the methodology and process

The study employed rigorous evaluation with counterfactual analysis combining both quantitative (cross-sectional survey with recall) and qualitative (semistructured interviews and case studies) research methods. The following sections first set out the methodological options considered and then present in detail the methodology selected.

Methodological considerations

Rigorous evaluation of the impact of an intervention requires in particular a careful analysis of the extent to which the changes in the variables of interest can be attributed to an intervention, checking inter alia known (and unknown) explanatory factors. Ideally, rigorous evaluation should be based on a mixed method design in which quantitative and qualitative methods reinforce one another in the establishment of causal relationships between the products and effects of the intervention (Leeuw and Vaessen 2009). Moreover, the qualitative and quantitative methods complement one another in analysing how, why and for whom given effects were produced.

The following discussion deals with the methodological aspects of the design for each of the research questions indicated. Questions 1 and 5 were approached by designing a counterfactual study.

1. Cervical cancer screening:

a. What is the net effect of the intervention in terms of coverage (number of people screened for cervical cancer) compared to the without-intervention situation?

This question will be taken up by means of counterfactual analysis. The situation of what happened as a result of the intervention will be compared with the situation that would have existed without the intervention. Given the specific scope of Ixchen, dealing with disadvantaged groups in non-randomly selected communities, developing a counterfactual comparison between participating and control groups ((quasi-)experimental approach) is a somewhat painstaking and expensive exercise. On the other hand, various factors call for further use of a simpler but still reliable counterfactual approach based on comparing the results of previous and subsequent screening examinations (regression-based approach). This is possible because the causal relationship between the products of the intervention and the results is simple and very strong.[102]

In this way a plausible estimation of the non-intervention situation can be established as well as a subsequent estimation of the net effect of the Ixchen programme in terms of number of women examined for detection of cervical cancer.

[102] The causal relationship between the intervention and the results is considered simple and strong because the intervention focused on more disadvantaged areas with low service utilisation in which the intervention is the strongest factor explaining increases in the number of people examined and treated for cervical cancer. In addition, MINSA coverage remained stable during the intervention period, thus probably there were no other interventions influencing demand for services.

b. What are the main factors that explain the scope of the intervention?

The purpose of this question is to ascertain the coverage or scope of the programme, for which purpose it was going to be appropriate to investigate the Ixchen approach through visits by the mobile clinics, as well as the activities in the treatment clinics. Semistructured interviews were conducted with clients, non-clients and key informants, supplemented by a survey of a representative sample of clients of the programme.[103]

2. What is the effect of the intervention in terms of knowledge and attitudes to cervical cancer and other SRH issues?

This question is important in the light of the explicit objective of the Ixchen/MINSA intervention of promoting changes with regard to knowledge, attitude and use of SRH services (see the intervention logic shown in figure 4.1). One of the topics it hoped to address was the apparent readiness of women to seek repeated examinations for detecting cervical cancer at intervals of several years. Given that methodologically it was difficult to construct a control group and obtain valid answers from the intervention and control groups, it was decided to follow a simple descriptive approach involving the use of a survey among a random sample of Ixchen clients (cross-section with recall), complemented by semistructured qualitative interviews and case studies among Ixchen clients and members of their families.

3. What is the effect of the intervention on the target group's use of other SRH services offered by the public, private and NGO sectors?

Question 4 was approached in the same way as question 3.

4. Treatment of clients for cervical cancer:

a. What is the net effect of the intervention in terms of number of people correctly treated (discharged) for cervical cancer compared to the without-intervention situation?

The estimate of the intervention's impact in terms of number of women correctly treated in comparison with the scenario without the programme was based on estimating the net effect in terms of people additionally examined to detect cervical cancer (see question 1). This would enable inferences to be drawn regarding the number of lives saved (morbidity and mortality).

[103] Among the assumptions set forth in the investigation protocol, it was hoped to conduct a 'comparison' between the CDR–Ixchen survey and the database of ENDESA (the Demographic and Health Survey 2006–2007) to obtain a national picture of the net effect and results of the programme. For this purpose, consideration was given to adjusting the overall characteristics of the ENDESA sampling framework using variables such as department, areas (rural and urban) and the fact that the women selected had undergone a cervical cytology at least once in their lives, among other categories of variables such as household and socio-economic characteristics, knowledge, attitudes and practices concerning SRH, use of SRH services, etc. However, this analysis could not be conducted owing to the limitations related to comparing two databases established for different purposes.

b. What are the main factors that explain (start and continuation of) treatment and drop-out ratios?

This question requires an evaluation of the treatment and referral chain from the moment a positive result was obtained after the cervical cancer examination until discharge, continued treatment or passing away. The reasons for continuing or discontinuing treatment may be classified into two major groups: the nature and quality of the follow-up and treatment by Ixchen, Profamilia and MINSA and the characteristics of the clients. These aspects were addressed by means of interviews with the medical personnel of these services, interviews with clients who completed or withdrew from the system in different phases of treatment, and a module in the mentioned survey.

5. How effective has the intervention been in terms of formation and sustenance of public-private partnership?

The question relates to the dimension of implementation (how well did it function in practice) and institutional effects of the public-private cooperation between Ixchen and MINSA, including other actors.

The assessment team analysed these issues primarily through semi-structured interviews with the staff of MINSA and Ixchen both at headquarters and in the field, as well as with the staff of the municipalities and community organisations, and with other key informants in the public and private institutions and in the communities.

6. How cost-effective has the intervention been in terms of cost per screening and cost per case detected?

It is probable that the cost of this programme may be relatively high, given that the intervention areas are remote and the cost of ensuring that services reach the clients falls entirely on the service provider. In addition, it is probable that the clients may be inclined to exhibit a relatively high incidence of dysplasia because many of them had never been examined before, and the treatment protocol attempts to compensate with greater individual care for the difficulty of maintaining contact with women exhibiting early lesions.

Bearing this in mind, the comparisons of direct costs with other screening and treatment programmes in Nicaragua, such as MINSA's static clinics for the detection of cervical cancer, probably show substantial differences in, for example, the direct cost of the examination per person examined.

Nevertheless, the cost-effectiveness analysis seeks to establish the result of the programme, based on what has been achieved with the resources utilised to date, in terms of cost per Pap smear conducted, cost per case detected and cost per case treated. This may be compared with the results of other approaches such as MINSA's static screening clinics. In addition, the cost per life saved was calculated.

7. What are important unexpected effects of this intervention?

The questions asked in the survey and the semistructured interviews with key informants as well as with the women and members of their families at different stages of the screening-treatment chain, were used to clarify the answer to this question.

Data collection tools

The research table (annex 5) summarises the relationship between the specific research questions, the research methods and the research participants.

Survey (cross-sectional survey with recall)

To complement the use of the information available in the database of both Ixchen and MINSA, the quantitative study made use of a survey to be applied to the direct clients of the Ixchen programme. This survey enabled information to be obtained first-hand on the impacts of the intervention being evaluated, in terms of coverage, effects on the use of other services, as well as other complementary information on aspects of follow-up, treatment (and its costs) and the current health status of the women.

The sections to be included in the survey were based on the questions already posed. The tool was subjected to field testing in order to ascertain its validity, and this step was utilised to improve the structure and design of the questionnaire. Thereafter, a database was constructed using the SPSS (statistical package for social sciences) programme, and was used by the surveyors to incorporate the data obtained in the field, as well as for the analysis of the information.

The survey was applied in person to 634 women selected at random in 21 municipalities (in 9 departments) that were selected, before the field work started and with the prior consent of Ixchen management and under their supervision, from the censuses available through the MINSA Family and Community Health Model.

Semistructured interviews

Rather than focusing on medico-technical issues, the qualitative study focused on psycho-social and care quality aspects, with emphasis on emotional care, institutional support and issues of gender, partner relations and the social support environment and network.

The interviews served to identify the factors affecting the rate of participation in cervical cancer prevention and care programmes. To identify these factors, the semistructured interviews included as participants in the study the clients of Ixchen, their family members and non-clients, as well as staff of different organisations (Ixchen, Profamilia, MINSA) and key individuals at the local and national levels.

Case studies

The case studies served to answer key aspects of the research, exploring the motives behind the results of the intervention and complementing the semistructured interviews. They were based on compiling detailed information in order to reconstruct clients' experiences

from different standpoints (personal, family, male and female friends). An attempt was also made to include the views of the service providers, but this proved impossible given that no way was found of establishing a relationship between the files available in Ixchen offices and those available in MINSA facilities. (No files on the selected clients were found in the Profamilia clinics; it was established that Ixchen had at one point withdrawn all of them.)

Cost-effectiveness analysis

The methodology for the cost-effectiveness sub-study was based on analysing existing information compiled from the physical and financial records and reports of the projects and other documentation from the participating institutions (Ixchen, MINSA), together with relevant results of the quantitative-qualitative sub-studies.

The disaggregated records of Ixchen, containing data on the diagnosis and treatment of every woman provided with care in the early lesion treatment clinics (CLT) and the respective referring entity (Ixchen mobile unit, MINSA or other), were utilised. The analysis maintained confidentiality of the information on each individual. The information in the records was supplemented by discussions with individuals in the participating institutions to clarify concepts and data and to ensure that the cost-effectiveness analysis covered the main elements of the programme.

To achieve the objective of the study, the following steps were taken:

1. Analysis of costs and assignation of indirect and administrative costs to the different components of the project (mobile units and early lesion treatment clinics (CLTs));
2. Calculation of the cost per examination and per case detected;
3. Calculation of the average cost per case treated in the precancerous lesion treatment clinics;
4. Estimate of the number of life years saved on the basis of a detailed analysis of the project records;
5. Estimate of the total cost (detection and treatment) per life year saved;
6. Identification of the other benefits associated with the project; and
7. Cost-effective analysis of the various components of the intervention; comparison with other providers in Nicaragua, other cervical cancer prevention strategies and other projects and programmes reported in the literature, and comparison of the cost of life years saved with gross domestic product (GDP) per capita.

Selection of informants

Quantitative research

To select the women surveyed, use was made of the censuses by the MOSAFC (Model for Family and Community Health) system of the Ministry of Health in the selected municipalities; this was done only to identify possible participants in the programme in the year when the intervention took place. With the support of the Ixchen staff, community leaders were identified who assisted in locating possible women participants in their homes and helped verify whether in fact the women were or were not part of the Ixchen activities. For each community, more than 45 names of women were available from the Ixchen

database, some of them without precise addresses, and from among these the women surveyed were selected at random (on average 30 per community). When a woman refused or was not present, the surveyors went on to the next in correlative order. Similarly, when it was available in the community, the support of the women already surveyed was used to find the homes of other women in the same community the leaders had not been able to locate.

Even when verified names of some women who had had the Pap smear conducted by Ixchen were available, some of these women refused to participate in the interview or said that they did not recall having participated (125 women); this is a large number considering that it is difficult to forget such an invasive examination. The survey did not insist on interviewing these women because it was felt that the refusal was due to personal issues and in order to respect the right to provide or not provide information. The municipalities in which a higher level of refusal to participate in the study was encountered were Masaya, Diriamba and San Ramón, where at least one out of every three women contacted did not wish to participate, giving as a reason that they were not aware of the programme. This lack of cooperation may be due in particular to the fact that because these are small communities many of the women know one another, for which reason factors such as embarrassment and mistrust were more frequently encountered among the women, especially as they knew in advance that their participation would be documented, even though it was specified that the data and how they were handled would be kept confidential.

There are no grounds for suggesting that there were substantive differences between the women who participated and those who decided not to participate in the study, above all with regard to geographical or socio-economic aspects, since other women close to the houses of those who did not participate but possessing similar characteristics (average age, housing conditions and apparent economic situation) decided to do so. In other words, all the participating women had the same possibility of being selected, and it depended above all on their decision.

Qualitative research

The selection of informants for conducting the interviews was performed intentionally, using the client database constructed in Excel in Ixchen's central offices, on the one hand, and the identification of local partners and actors by Ixchen staff at both the national and the local levels, on the other hand.

A total of 79 interviews was conducted, distributed among the different categories of participants identified. In the process, account was taken of all the ethical recommendations that had been drawn up.

Sampling

Quantitative research

The intention was to conduct random sample selection of Ixchen's clients, since this has greater statistical power. In practice, simple random sampling was impossible to conduct, for a number of reasons:

- Detailed data were available only on the programme clients who had early or cancerous lesions, not for other clients of the programme such as those who had a Pap smear;
- The data available for all the clients who had a Pap smear conducted by the programme's mobile units were in general files of the programme, but were very often imprecise and incomplete, making it impossible to identify the client's address; and
- The base files on the clients, which might have provided more information, were not available for reconstruction of the database for selecting a sample.[104]

Given the above factors, it was decided to conduct cluster sampling, dividing the population into groups, although this has less statistical power; a larger sample size was thus necessary in order to obtain a degree of precision comparable with that of simple random sampling. The sample, originally comprising 420 informants, was calculated on the basis of a 90% confidence interval, a level of precision of 4% and an estimate of the population parameter of 50% in relation to the estimated percentage of women aged between 15 and 49 who had never had a cervical cytology conducted.[105] The cluster sampling started from an estimate of 50% more than the sample proposed in the preparatory phase (420), thus amounting to 630 people. With regard to the selection of the municipalities, digitalisation of data from Ixchen's records was performed for 1,260 cases at random, out of which a random selection was also made of 21 municipalities in which the Ixchen mobile units had a presence; for each municipality a sub-selection was made at random between two or three communities, using the digitalised data. The 21 communities selected were in nine departments of Nicaragua's territory.

In each community an average of thirty women participating in the programme were interviewed, giving a total of 634 questionnaires in the nine departments selected. The sample obtained is representative of the population of Ixchen programme clients, in that 1,265 cases were selected and digitalised from the records containing information on the programme clients, and information was obtained on municipalities served, the age of the clients at the time of the Pap smear with Ixchen and the year in which the Pap smears were conducted. The average age at date of first Pap smear of the clients surveyed coincided with the average age of the programme's clients in the sample taken from Ixchen's files.

Qualitative research

Utilising the Ixchen database containing a total of 4,432 results of Pap smears, the records were classified by department and by diagnosis. The sampling employed for this study was intentional. The SILAIS selected were those which showed a larger number of women with positive results and a larger specific number of CIN I to CIN III diagnosis,[106] thus increasing the probabilities of finding a larger number of successful cases, more drop-out and more

[104] Ixchen reported that the files were all destroyed in 2010, files being kept only on women who had positive cytological results.

[105] The estimate ranged between 18% and 48%, and in the areas covered by Ixchen was higher than 48%. The estimate was based on a less optimistic scenario in terms of a sample size of 50%.

[106] CIN – Cervical intraepithelial neoplasia: an abnormal and pre-cancerous growth of squamous cells in the uterus. According to the damage to the cervical epithelium, the CIN may be classified as I, II or III, with the larger number indicating greater damage (see glossary).

and less prevalence of serious cases. These were the Managua, Matagalpa and Nueva Segovia SILAIS. From these three, the municipalities with a larger number of cases were selected, for Managua, Managua municipality, for Nueva Segovia, Ocotal and Jalapa municipalities and for Matagalpa, Matagalpa and Tuma-La Dalia municipalities. With regard to Jalapa municipality, a change took place at the time of the field visit, when it was found that the mobile unit had never reached Jalapa municipality; it was decided to select Dipilto municipality, which the mobile unit did reach.

Data collection and ethical considerations

In the process of compiling the data, a number of prior steps were taken to prepare for the field work, since apart from the fact that this is a preparation required for any type of formal and rigorous impact study, the topic of cervical cancer and topics relating to the SRHR of women in rural communities are highly delicate ones, given the social, family and political conditions in Nicaragua.

- External development and revision of the tool (survey questionnaire, interview guide)
- Selection and training of surveyors and interviewers
- Validation of the instrument in the field
- Field work with the participation of someone delegated by Ixchen to facilitate the location of the women in their homes and introduce them to the surveyors/interviewers in order to create an atmosphere of trust. This person ensured that the person selected was in agreement with being visited by the investigating team, even before informed consent was requested. (The Ixchen representative did not personally attend the interview.) Every interview took approximately 30–45 minutes.
- Informed consent. As part of the process of obtaining ethical approval through the National Health Committee in Nicaragua, in this case given by the Institutional Ethical Review Committee of the Teaching and Research Department of MINSA, it was agreed to produce an informed consent form.
- As part of the ethics of the study, interviews were not conducted with women who did not wish to provide information, although the purpose and the implications of the study were still explained to them. Although this cannot be assumed to be the case, the process of signature and consent may partly explain the proportion of women who did not wish to participate in the study.

Consultative process

The process that accompanied the implementation of the study was consultative in order to strengthen the validity of the research questions asked, the methodology and data compilation tools, and the results and conclusions.

At the international level as well as in Nicaragua, a Local Reference Group was established, made up of representatives of stakeholder organisations and experts on the subject. In Nicaragua, the members of the Group were the Ministry of Health (MINSA), the Nicaraguan Gynaecology and Obstetrics Association (SONIGOB), the Pan American Health Organisation-World Health Organisation (PAHO-WHO), the Embassy of Spain and the Embassy of the Kingdom of the Netherlands.

As a first step in the implementation phase of the study, the complete research protocol was drawn up. This was submitted to the Nicaraguan reference group for technical review; many comments were obtained which were of assistance in improving the protocol. Thereafter, the improved version of the protocol was submitted to the MINSA Institutional Ethical Review Committee, which gave its ethical endorsement.

Once the quantitative and cost-effectiveness studies were completed and the qualitative study was semi-completed, a workshop was held in Managua to validate the preliminary results of the three partial studies. This workshop offered a broad opportunity for peer exchange (within the research team, which itself was diverse) and with representatives of Ixchen and members of the Nicaraguan reference group.

Once the partial studies had been consolidated into a single consolidated report, the draft of the latter was again shared with the stakeholder organisations in Nicaragua (Ixchen, MINSA, local reference group) for comments before the final report was submitted to the Ministry of Foreign Affairs in The Hague for consideration by the international reference group.

Annex 3 Quantitative study: Methodology for counterfactual analysis of Pap coverage

With respect to the coverage, a counterfactual analysis was conducted on the net effect of the Ixchen intervention on Pap smear coverage; this was supplemented by a medium-term analysis of the impact of the intervention – before and after Ixchen. An analysis of this kind means that the situation of what happened with the Ixchen intervention will be compared with the situation of what would have happened without the intervention. To determine coverage, and whether the Ixchen intervention had some impact, the analysis will be approached from two different perspectives:

A. Determination of the net effect of the Ixchen intervention in terms of Pap smear coverage; in other words the situation with and without Ixchen;
B. Supplemented by an analysis of the medium-term impact on number of women who had a Pap smear conducted before the Ixchen check and the number of women who had a Pap smear conducted after Ixchen.

A. Analysis of the net effect of the intervention

The analysis of the net effect of the intervention with respect to Pap smear coverage was conducted from two perspectives: the situation with the Ixchen intervention and the situation of what would have happened without the Ixchen intervention. Given the availability of data on the Pap smear history of the clients surveyed (from the CDR–Ixchen survey), their age, and knowing the duration of the programme, it is possible to verify on average the effect the programme may have had. To conduct this calculation a simple formula will be employed which makes it possible to verify the average number of Pap smears conducted in a three-year period before the Ixchen intervention, given that the comparison period is the period of the intervention and that this was three years. Following this logic, the calculation was performed in the following way (individually) for each of the 634 observations:

(1) Average Paps before Ixchen by 3 years = PP / (A/3)

Where:

A =	Years of reproductive age, equivalent to: Age in 2005 (before the Ixchen intervention) –15 (onset of reproductive age)[107]
PP =	Number of Pap smears conducted prior to the Ixchen intervention

An example of the calculation to be performed could be the following: a woman aged 60 who has had five Pap smears before Ixchen. Given the formula, the result would be:

Average Paps before Ixchen by 3 years =5/((60–15)/3)=0.33

[107] Although some scattered data were found on women for whom reproductive age began before 15 years, it was considered that this was the onset of reproductive age, on the basis of data obtained from the World Health Organisation, http://www.who.int/mediacentre/factsheets/fs334/en/index.html.

Once this average has been calculated for each observation, the average for all the observations will be obtained; this would indicate, in this case, an average index of Pap smears taken by the clients surveyed before the intervention and during a period (three years) equal to the duration of the Ixchen programme; in other words, it would provide an overview of the situation without the Ixchen intervention. This index would represent this overview in percentage form.

The average index obtained from the sample in the CDR–Ixchen survey would have to be adjusted to a confidence interval. Calculation of the confidence interval is a technique which will enable statements to be made about the values that can be expected for a given parameter, in this case a range of the average index of Paps conducted 'without the Ixchen intervention'. The calculated interval will depend both on the estimate of the index and on the sample size, as well as on the probability (confidence interval) that the population average belongs to the calculated interval. In this case a confidence interval of 90%[108] for the average index calculated:

$q=1-p;$

Taking:

$\Delta=|Z|*\sqrt{(pq/n)}$

Where:

$p-\Delta < p < p+\Delta$

$p=$	Average number of Pap smears performed before Ixchen in a three-year period (average for the entire sample)
$q=$	Probability of non-occurrence
$Z=$	1.65 (given the 90% confidence on the normal curve)
$n=$	Sample size
$P=$	Real probability (with 90% confidence interval) of having had a Pap conducted in a random three-year period before the Ixchen intervention
$\Delta=$	Value of the interval

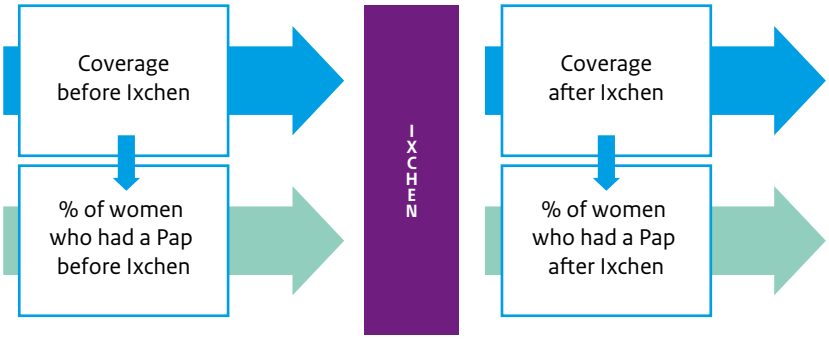
After the confidence interval has been calculated for the average index of Paps without intervention, this range can be extrapolated to the population of women who had cervical cytologies performed with Ixchen during the intervention (66,512 cervical cytologies or Pap smears). This simple operation (multiplication of the total number of Ixchen cases by the average number of Paps with the 90% confidence interval) will in this instance provide the number of cases (cytologies performed) without Ixchen, and hence, by subtraction, the net number of cases due to the programme's intervention.

[108] It is important to mention that the calculated confidence interval may be slightly wider, given the circumstances of the cluster sampling performed.

B. Medium-term situation – situation before and after Ixchen

To know how lasting the Ixchen intervention has been in women's awareness with regard to medium-term demand for the Pap smear, there is a need to determine the percentage of women who have had a Pap smear performed at two junctures: before and after the Ixchen intervention. This comparison has various limitations, relating primarily to the possible conclusion that differences between the two junctures are attributable to the Ixchen intervention. This would be a good conclusion if one could ascertain that all the other factors would remain constant, in which case the entire change could be attributed to the programme. Nevertheless, this cannot be assumed, and the analysis thus needs to be treated with caution. On the other hand, the analysis may, despite this limitation, give an idea of coverage at two junctures, and if there are differences one of the possible factors explaining these differences may be the Ixchen intervention.

Figure A3.1. *Counterfactual analysis*



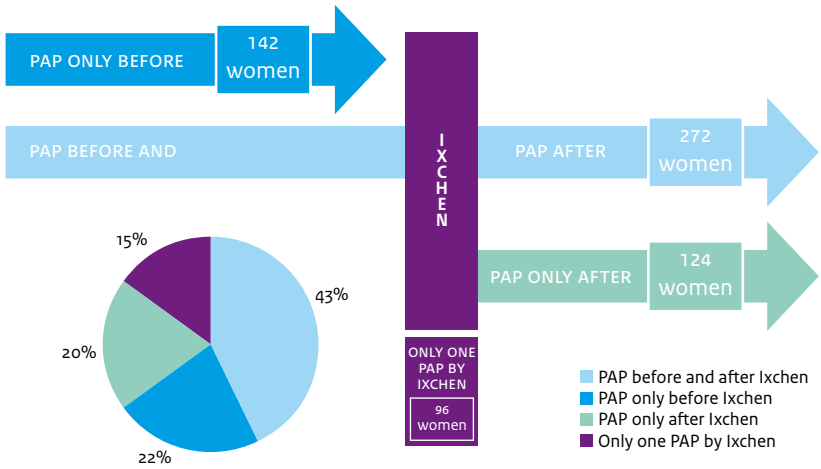
Source: Drawn up by the authors.

A dependent variable of this type does not follow a linear distribution, since the woman either may or may not have had the Pap smear performed, and there is nothing between these two possible responses.

An analysis like the foregoing is possible given the availability of the data from the CDR-Ixchen survey regarding the Paps history from their first Pap to the last, of the women who have had at least one Pap smear in their lives from their first Pap to the last, and still more important, the juncture at which they did so. In addition, the date of the first contact with the Ixchen mobile units is known. In other words, the available data can be used to determine coverage before and after Ixchen. Figure A3.2 presents the statistics describing the entire sample for Pap smears in relation to the time of the Ixchen intervention. At first sight, the results do not appear all that encouraging, in that the group of women who had a Pap smear performed only before is larger than the group of women who had a Pap smear only after the Ixchen intervention. In other words, there appears to be a net negative effect.

However, as will be argued below, it is important to control for a number of factors in order to pursue the analysis in greater depth.

Figure A3.2. *Number of women who had at least one Pap before and after Ixchen*



Source: Drawn up by the authors on the basis of data from the CDR–Ixchen survey (2011).

For this analysis a comparison is made between the percentages of women who have had one or more Pap smears before and after the intervention by the Ixchen programme. However, this comparison needs to be controlled by age in some form, otherwise the age effect may bias the results. If a woman aged 18 is compared with a woman aged 50, the latter, simply because she has been of fertile age for more years, has a greater probability of having had a Pap smear conducted at some point in her life than the former.

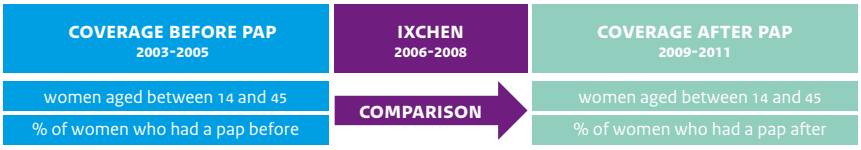
Another bias that has to be avoided is represented by the differing time periods. If the percentage of women who have had a Pap smear performed at some point in their lives before the Ixchen intervention is compared with the percentage of women who have had a Pap smear after the intervention, two very distinct time periods are being compared. The first phase of the Ixchen programme was implemented during the years 2006–2008. If 2008 is taken as the end of this first phase, there were a little less than three years until the time the survey was conducted, in August 2011. Comparing only three years with all the years 'before the Ixchen Pap smear', which may be many in number, would entail a serious bias in the results.

Figure A3.3 explains the knowledge of the analysis for avoiding both the age bias and the bias resulting from the different period lengths. For the former, only women aged between 14 and 45 in the period for the Ixchen Pap smear were selected, and the comparison was made only with women in the same age range in the period after the Ixchen Pap smear. This introduces another challenge. If the same age range is considered for each period, this very

fact means that the sample varies from period to period. For this reason, the composition of the sample may change, for example, by geographical area. Nevertheless, in analysing the data it was considered that this variation was minimal. In addition, given that the Ixchen programme had a presence in all the departments covered by the survey, the small variation that may have occurred as a result of analysing the data in this way was accepted.

For the second, the comparison is confined to only three years before the Ixchen programme (2003–2005), because after the programme information on only three years is available. If it is found that a greater percentage of women aged between 14 and 45 had a Pap smear in the period 2009–2011, after the Ixchen programme, than the percentage of women in the same range between 2003 and 2005, it may be that this difference is explained in part by the effect of the Ixchen programme on the women's awareness and their demand for health services, particularly the Papanicolaou test.

Figure A3.3. *The logic of the analysis applied to the Ixchen study*



Source: Drawn up by the authors.

C. The probit model: An approach to the factors influencing demand for Pap smears

To complement the main analysis of the net effect of the intervention and the medium-term impacts, a multivariable regression analysis was conducted to analyse the factors affecting the woman's decision to have a Pap smear conducted. While this regression analysis cannot determine the effect of the programme, it does offer a first approach to the factors unrelated to the Ixchen programme which explain behaviour relating to use of women's reproductive health services in more general terms. In these cases, statistical techniques based on Maximum Likelihood Estimation are utilised, in this instance the probit model.[109] This multivariant regression technique investigates the impact of a series of independent variables, such as educational level, age of the woman, receipt of remittances, etc. have on the probability that a woman has decided to have a Pap smear conducted at two points in time: before and after the Ixchen intervention.

[109] A probit model is a type of regression in which the dependent variable may assume two values (0,1) associated with the probability of the occurrence of other independent variables.

$Y_i^*=\alpha+\beta X_i+\varepsilon_i$

With:

$\varepsilon_i \sim N(0,1)$

Y_i^* Estimates the probability that Y_i : the woman has had a Pap smear before (or after, depending on the model to be estimated) the Ixchen intervention. Y_i is a binary variable which may assume only two values: 0 = No Pap smear conducted before the Ixchen intervention; and

(1) = Pap smear conducted before the Ixchen intervention. The variable Y_i^*, however, is an estimate of the probability (π) that $Y_i=1$. In other words:

Y_i	Y_i^*
0	$1-\pi$
1	π

Probit analysis estimates the impact of a number of independent variables (x_i) have on the probability of having had a Pap smear conducted before the Ixchen intervention. In this study, on the basis of data availability, the following models were analysed:

Model for determining the factors influencing the woman's decision to have a Pap smear

$$(1)\ Y^*_{before\ Ixchen\ i} = \alpha + \beta_1 A_i + \beta_2 E_i + \beta_3 J_i + \beta_4 I_i + \beta_5 H_i + \beta_6 S_i + \beta_7 PA_i + \beta_8 P_i + \beta_9 C_i + \beta_{10} O_i + \beta_{11} Z_i + \varepsilon_i$$

$$Y^*_{\text{antesdelxcheni}} = \alpha + \beta_1 A_i + \beta_2 E_i + \beta_3 I_i + \beta_4 H_i + \beta_5 S_i + \beta_6 P_i + \beta_7 C_i + \beta_8 O_i + \beta_{10} Z_i + \varepsilon_i$$

$$Y^*_{\text{antesdelxcheni}} = \alpha + \beta 1\ \ A_i + \beta_2 E_i + \beta_3 I_i + \beta_4 H_i + \beta_5 S_i + \beta_6 P_i + \beta_7 C_i + \beta_8 O_i + \beta_{10} Z_i + \varepsilon_i$$

Where:

A:	Age in years
E:	Education, level attained or number of years
I:	Income sources: two dummies on access to paid employment and remittances
J:	Head of household (dummy)[110]
H:	Children (No.)
S:	Distance (in time) to closest health services
PA:	Availability of midwifery services (and other services, see section 4.3.1) (dummy)
P:	Partner support index, with the range 0 (no support) to 2 (high support)
C:	Knowledge of family planning methods
O:	Membership in some social, political or religious organisation or community association[111]
Z:	Area of residence using two indicators: rural/urban and department

Model for determining the factors influencing women's decision to continue having Pap check-ups

The second model analyses the factors that explain whether ***after*** the Ixchen intervention the women continue to have Pap smears. This model includes, in addition to the indicators in model 1, whether or not the women attended the Ixchen information talk, the level of satisfaction with the Ixchen services and the possible costs of the intervention (while it is supposed to be a cost-free service, there may for example be transport costs).

$$(2)\ Y^*_{after-Ixchen\,i} = \alpha + \beta_1 A_i + \beta_2 E_i + \beta_3 J_i + \beta_4 I_i + \beta_5 H_i + \beta_6 S_i + \beta_7 PA_i + \beta_8 P_i + \beta_9 C_i + \beta_{10} O_i + \beta_{11} Z_i + \beta_{12} CHA_i + \beta_{13} SA_i + \beta_{14} CI_i + \beta_{15} HI_i + \beta_{16} TE_i + \varepsilon_i$$

[110] In regression analysis, a dummy variable or 'indicative variable' is one which may assume the value 0 or the value 1 to indicate the absence or presence of an impact that may affect the change in the results. In the case of head of household, the dummy variable refers to two options: being (1) or not being (0) the head of household; this is similar for other variables of this type.

[111] In different models a dummy is used to capture membership in an organisation (regardless of type) and whether it appears statistically significant in various repetitions.

Where:

CHA:	Attendance at the Ixchen information talk (dummy)
SA:	Level of satisfaction with Ixchen services over the range 4–24, with 24 being the highest satisfaction score[112]
CI:	Costs of the Ixchen service (specifically costs of transport to the mobile unit, in that for the women the check-up is free of charge)
HI:	Presence of children in independent care (two categories: less than 6 – the age at which they enter primary school – and 7 to 12 years old)
TE:	Time until delivery of the Pap result by Ixchen

Given that the sample contains women of all ages and that the older women have, simply for this reason, a greater probability of having had a Pap smear conducted, an age check needs to be conducted. In this way it is ensured that 55-year-old women will not be compared with 15-year-olds who have barely entered reproductive age. This check was performed in two ways. First, all the women who were selected were at least 18 years old in 2006, the first year of operation of the Ixchen mobile units.[113] Given that ideally, although not necessarily in the Nicaraguan context, it is assumed that the women should have regular Pap smears conducted from about the age of 14, which is considered as reproductive age, if this criterion of age 18 in 2006 is used there are four preceding years in which the women could have had a Pap smear. In other words, in the ideal scenario all the women selected for the model had already had a Pap smear performed before 2006 (the year in which the Ixchen programme began). If that is not the case, the reason why not can be investigated. Second, the regressions include a control variable for 'age' in order to capture this effect.

The results of the model represent changes in probability, not marginal effects. In other words, a positive coefficient for the independent variable 'Years of study' of 0.026 in model 1, for example, means that the probability of a Nicaraguan woman possessing the characteristics sought in the study had had a Pap smear conducted before the Ixchen intervention increases by 2.6 percentage points for each year of study she has completed.

[112] In the survey, four aspects of satisfaction were inquired into (care received by the woman, the staff's knowledge, quality of services, activities by the mobile unit). The women were asked to give a rating from 1 (excellent) to 6 (very poor) for each point. Satisfaction was calculated by assigning 6 points for greatest satisfaction and 1 for the least. Thus the index, representing the sum of the satisfaction points for the four points, ranges from 4 (very poor on all points) to 24 (excellent for all points).

[113] Subsequently, the same was done for all women who were at least 15 years old in 2006, in order to review the results of the first group.

Annex 4 Cost-effectiveness study: Methodology and calculations

General methodology

The methodology for the cost-effectiveness study was based on analysing existing information compiled from the physical and financial records and reports of the project and other documentation from the participating institutions, together with the relevant results of the quantitative and qualitative studies forming part of this assessment.

To ensure the quality of the data, apart from the tables summarising the project, reports on the breakdown of the Ixchen records were used containing data on (i) the diagnosis and treatment of every woman who attended the early lesion treatment clinics (CLT) and (ii) from which organisation (Ixchen, MINSA or other) they were referred to CLT. The analysis maintained confidentiality of the information on each individual.

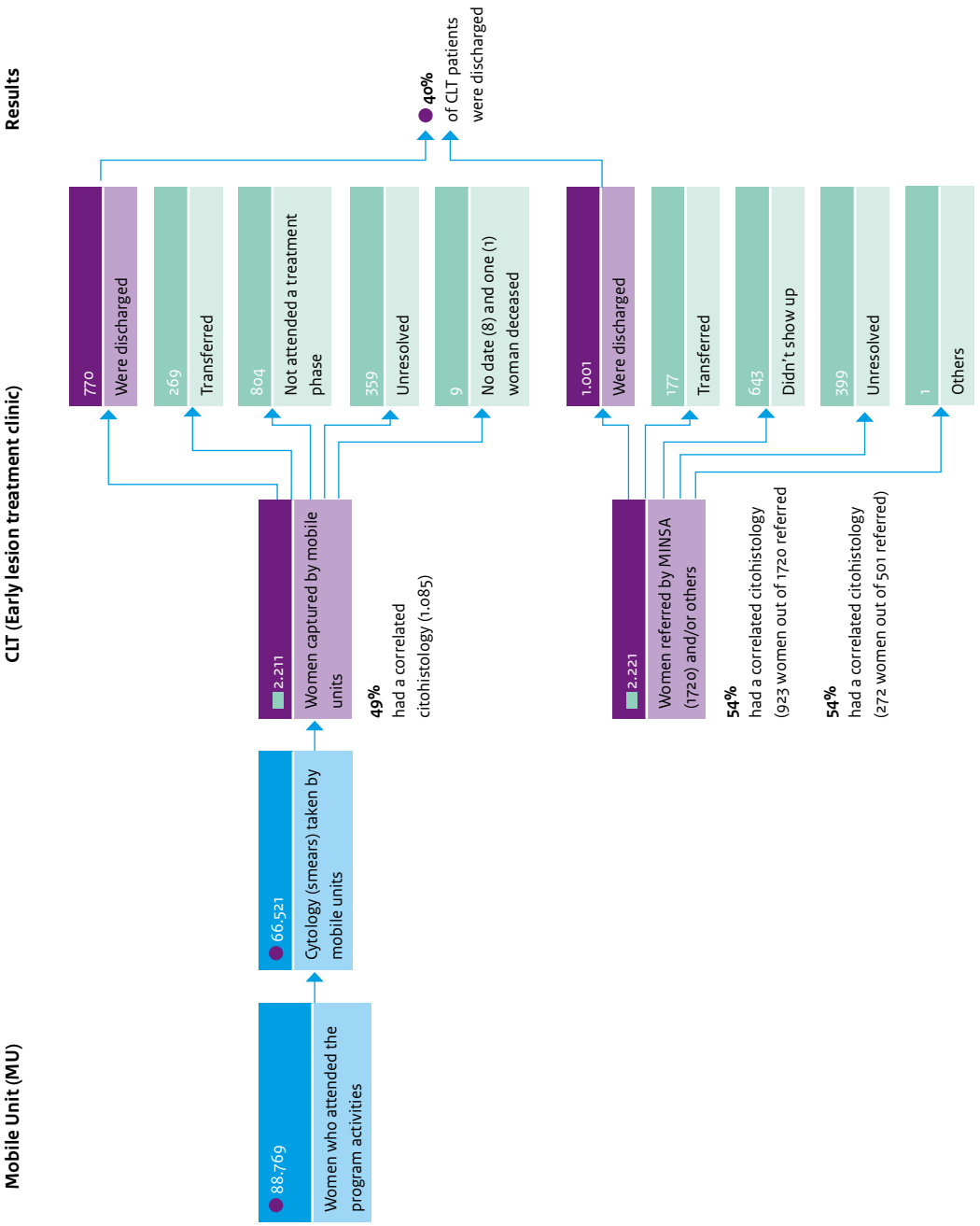
The information from the records was supplemented by discussions with people from the participating institutions to clarify concepts and data and ensure that the cost-effectiveness analysis covered the main components of the programme.

To attain the objective of the study, the steps described in the relevant chapter were taken. Figure A4.1 shows the number of women who attended the mobile units, the number of cytologies, the number of women referred to the CLTs by other agents and the results at the end of the project period. The diagram shows that we have complete data only on the 1,771 women discharged from the CLTs, representing 40% of all women who received treatment. The other 60% did not attend at some point in the treatment chain (33%), were pending when treatment ceased at the end of the project period (17%) or were transferred to another service provider (10%).

Then, on the basis of the figure, we calculate the rate of women 'correctly treated', defined as 'discharged'. These results are based on the Ixchen database, which could not be verified. In addition, the 60% on whom precise information was not found are not included. In practice, then, the rate could be higher.

To overcome the problems of estimating the probable final results for the 60% with incomplete data, we decided to calculate the rate of costs per life year saved. We assumed that the minimum number of years saved corresponds to the women with a positive diagnosis who were discharged (who we know were cured). We assume that the maximum number of years saved would occur if all the women whose final result we do not know (those who did not attend or were transferred or pending) were also cured (this is not very probable in practice, but is a reasonable assumption in the absence of complete data).

Figure A4.1. *Diagram Sector Programme, CC, Ixchen Nicaragua, 2005-2008*



Sources: 2009 Ixchen, and Ixchen database

Direct costs

The table below summarises the costs of the programme in terms of inputs by donors. All the costs included in the Netherlands' budget as well as a contribution from UNFPA should be regarded as direct costs incurred specifically for the implementation of this project.[114]

Table A4.1 Project cost: Netherlands and UNFPA inputs

Item	Cost, US$	Comments
Total cost of project	2,267,979	Includes establishment and operation of the mobile units and laboratory and the treatments in the CLTs; residual value of laboratory and vehicles deducted. Includes UNFPA contribution.
Cost of establishment and operation of the mobile units and the cytology laboratory for three years	1,884,532	It is estimated that the laboratory and office have a working life of 15 years and the vehicles seven years. Other equipment deemed to be amortised in three years. This amount represents the cost of examinations and detection of cervical cancer cases.
Cost of treatments in the CLTs	383,447	Total paid to the Ixchen and Profamilia CLTs. The services were paid for on the basis of a scale of prices agreed for the project. We assume that these prices represent the real cost of the treatment.

Source: Ixchen financial records.

Costs incurred by women clients

The data from the quantitative survey forming part of the assessment were used to estimate the costs to the women of having a Pap smear and visiting the CLT.

- For the Pap smear, 95% of the women had no out-of-pocket expenses, and the time taken to visit the mobile units was short. We estimate a total of one hour including the time taken to get there (average 12 minutes),[115] time spent assisting educational talks, and having the Pap smear taken.
- Although 67% of the women are unpaid housewives, we can estimate an opportunity cost, based on the minimum agricultural wage in Nicaragua during the period covered by the assessment, which on average was US$0.30 per woman. As this opportunity cost is very low, we did not include it in the calculations for this study.
- For the treatment of those who had a positive Pap result, the women incurred out-of-

[114] Possibly, some expenditures did not relate in their totality to the execution of this project, and/or benefited other aspects of Ixchen's work (such as preparing educational materials, some salaries of administrative/financial staff), but this would have been compensated for by the indirect costs incurred by Ixchen which were not included in the budget, such as administrative and institutional costs, time spent by management in supervision and monitoring of the project, use of existing infrastructure, etc.

[115] CDR–Ixchen survey, 2011.

pocket expenses for transport, food and drugs. The average expenditure for the entire treatment was C$967, equivalent to US$56 at the average exchange rate for the project period. By type of expenditure, the women spent on average C$404 on transport, C$166 on food, and C$338 on drugs.

- Although many of the women were not in paid employment, we estimate the opportunity cost of attending treatment on the basis of the minimum agricultural wage for the period, US$2.55 per day. With an average of four visits at a cost of one day's minimum wage per visit, the opportunity cost was US$10.20 per woman, giving a total for out-of-pocket expenses and opportunity costs of US$66.20 per woman treated.

The costs incurred by the women are added to the total for costs of examinations and treatment given below.

Cost per Pap smear

We assume that all the mobile unit and laboratory costs were incurred for conducting the Pap smear;[116] this yields a cost per Pap smear of US$43, taking into account only the additional number of Pap smears that can be attributed to the project activities (see section on net effect of Pap coverage). These figures do not include the costs to the women, which for taking the Pap smear were very low.

Table A4.2 Cost per Pap smear

Category	Number of Paps	Cost per test, US$	Comments
Total women attending mobile units	66,521	28.33	-
Women attending mobile units who would not have had a Pap in the absence of the project	44,058	42.77	Average of the range identified by the quantitative study

Cost per woman with cervical cancer

The project records indicate that a total of 4,432 women received treatment in the CLTs. This figure is slightly higher than the figure given in the final project report. The total includes 2,211 women who attended the mobile units and 2,221 referred by other organisations, predominantly MINSA (1,720) (see figure A4.2).

The women with a positive diagnosis included a range of diagnoses associated with cervical cancer, from HPV and low-grade lesions to invasive cancer. There were also diagnoses which may or may not be related to progression to cervical cancer, and others that were detected by the Pap smears but are not associated with cervical cancer.

[116] The mobile units also performed follow-up work on the women who were in the CLTs, but we had no reliable data on the percentage of time and resources of the mobile units allocated to these functions, and accordingly we apply all the costs to the detection phase.

Tabel A4.3 Cost per woman with cervical cancer detected		
Category	**Cost per woman detected, US$**	**Comments**
All women attending the mobile units and referred to the CLTs	852	Does not include women captured by MINSA and referred to the CLTs
Women covered by the mobile units with a diagnosis associated with cervical cancer	1,570	Does not include women captured by MINSA and referred to the CLTs

CLT = Early lesion care clinics.

The vast majority of the women with HPV returned to normal, and did not progress to cancer,[117] and between 40% to 60% of CIN I cases[118] may undergo spontaneous regression.[119] In static clinic programmes readily accessible by the clients, the majority of women diagnosed with HPV or CIN I do not receive immediate treatment, but are monitored and given treatment in future if necessary. In this project, all the women with these diagnoses were referred to the CLTs in order to minimise the potential loss of cases that might need treatment.

The cost per woman with a positive diagnosis detected by the mobile units, including all diagnoses whether or not associated with progression to cervical cancer, was US$852.

Including only the women with diagnoses associated with cervical cancer (HPV, CIN I, II and III and invasive carcinoma, a total 2,667 cases of which 45% were brought in by the mobile units), the cost per woman with a positive diagnosis and potential for progressing to cervical cancer rises to US$1,570. This figure reflects the high cost of securing attendance by women in remote areas and the narrow range of services offered by the project.

Cost per woman treated

The project protocols were designed to minimise losses of women who might need treatment, bearing in mind the difficulty of access to the CLTs by the women. Thus colposcopy was recommended for all women with abnormal Pap diagnoses, although normally many of them would be subject to monitoring and referred for colposcopy only in the case of a progression to diagnoses associated with cervical cancer.

Of the 4,432 women treated in the CLTs, 2,211 came from the mobile units, 1,720 were referred by MINSA and 501 were referred by the clinics of Ixchen and other NGOs or presented themselves without referral.

Of the 4,432 women, only 2,667 diagnoses were confirmed by biopsy as conditions associated with cervical cancer, namely HPV infections (1,127), slight, moderate or severe lesions (CIN I (819), CIN II (356), CIN III (460)); or cancers (75).[120] Almost half these diagnoses (1,127) were of HPV, of which as already mentioned only a low percentage

[117] Goldie et al. 2006.
[118] NIC: see glossary.
[119] MINSA 2006. Other authors cite higher regression rates.
[120] These figures include the estimated number for those not attending, transferred and pending.

progresses to cancer. It should be noted that the correlation between the Pap diagnoses and those from biopsy was only 51%. The Pap smear is highly specific[121] but its sensitivity[122] is not very high. In this programme the number of women with HPV was very similar according to both Pap and biopsy, but the number of CIN I, II and III lesions confirmed by biopsy was lower than the Pap results, and the number of invasive cancers was three times higher.
The table given in the relevant chapter presents the costs per woman treated (i) taking into account only the costs of treatment in the CLTs and (ii) including all costs of the project. The data are broken down by source (mobile units or MINSA) and by type of diagnosis (directly related to cervical cancer or not). The latter includes the costs incurred by the women for their treatment, data which we possess from the quantitative study conducted during the assessment. The table indicates that the cost of treatment itself is relatively low, the majority of the project costs being incurred on the fitting out and operation of the mobile units.

Cost per life year saved

Cost per life year saved is the parameter normally used in cost-effectiveness studies to compare strategies and interventions and to evaluate their costs in comparison with a static parameter.[123] WHO[124] recommends comparing the cost per life year saved with per capita Gross Domestic Product (GDP); any intervention with a cost per life year saved lower than this figure is regarded as cost-effective.

To calculate the number of life years saved and the cost per year saved in this project, it was first necessary to estimate the number of life years saved, taking into account that (i) only a percentage of early lesions would have undergone progression to cervical cancer and (ii) no data were available on the final outcome for women who did not attend for treatment, were transferred or were pending, who represent no less than 60% of the total.

To take the unknown elements into account, we opted for calculating minimum and maximum life years saved.

- The minimum represents the women discharged from the programme, on whom we have more information. Within this group, we assume that in the absence of treatment progression to cervical cancer would have occurred for:
  - 10% of those diagnosed with HPV (very generous, only a small percentage progress);
  - 50% of those diagnosed with NIC I (also a generous estimate, the literature indicates that around 70% undergo remission to normal spontaneously without treatment);
  - 100% of NIC II and III and invasive cancer.
- To calculate the maximum life years saved we used the same assumptions, applying them to all women discharged, not attending, transferred and pending. It should be noted that this is optimistic, given that 36% of the women brought in by the mobile units and 29% of those brought in by MINSA did not attend at least one point in the treatment chain.

[121] Specificity: Capacity for identifying women who do not have cancer.
[122] Sensitivity: Capacity for correctly identifying the women who do have the disease.
[123] Goldie et al. 2005, Sherris et al. 2009.
[124] WHO 2001.

The calculation of life years saved took into account the age range of the women treated, the diagnosis and its probability of progression to cervical cancer, and the life expectancy of women in Nicaragua. The average of the ages of the women in each category and an average life expectancy of 76 were used,[125] and it was assumed that the time for progression to the development of cervical cancer was 10 years for HPV cases, NIC I and NIC II, and five years for NIC III and invasive cancer.[126]

It is important to distinguish between the results for the women who attended the mobile units and the total number of women treated, more than half of whom were referred by MINSA and other organisations. The cost-effectiveness of the entire project substantially increases if we include them all, because the number of women treated in the CLTs doubles, without additional expenditures being incurred for securing the attendance of women at the mobile units.

Comparison with the cost-effectiveness of other providers in Nicaragua

The recent study by Alvarado and Martínez Granera (2010) compared the cost-effectiveness of various Pap-screening programmes in Nicaragua over the period 2000–2010. The results cannot be compared directly with this study because the assumptions differ, the categories of costs included vary and different types of cases are included or omitted. The authors assume that every woman treated has a survival of 20 years, with no breakdown by age of women treated and type of diagnosis.

The table given in the relevant chapter shows the Alvarado results and our own. To facilitate comparison, we apply the 20-year survival to our data on life saved by mobile units, giving a minimum cost per life years saved of US$149 and a maximum of US$531.[127]

The variation in cost-effectiveness of the different interventions is due in part to the differences in types of cost included. Nevertheless, it is noteworthy that the projects of organisations such as ICAS and Ixchen, which are targeting hard-to-reach groups and apply a large portion of their projects' resources to securing the attendance of these women, are less cost-effective than those working with more accessible groups.

The evaluation of the cost-effectiveness of providing services to hard-to-reach groups represents one part of the evaluation of projects of this type, whose additional benefits for women in remote and isolated communities are large, but difficult to measure in quantitative terms.

[125] United Nations 2011.

[126] Although we believe that the calculation of life years saved should take into account both the age of the woman and the type of diagnosis, we also performed a calculation based on an average of 20 life years for all cases treated, in order to facilitate comparison with the results achieved by other providers in Nicaragua (Alvarado and Martínez Granera (2010)) who used this parameter for women's survival. The cost per life year saved is the total cost of the project plus the costs incurred by the women themselves divided by the number of years saved, in accordance with the assumptions indicated.

[127] These figures are high because our original calculation based on the age group profile of the women and the average life expectancy gives a greater average survival, and accordingly a lower cost per life year saved.

Evaluation reports of the Policy and Operations Evaluation Department (IOB) published 2008-2012

Evaluation reports published before 2008 can be found on the IOB website: www.rijksoverheid.nl/bz-evaluaties

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Front photo: Ixchen poster on their cervical cancer mobile team services, Palo Quemado school, March 2011, during field trip of evaluation team
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This impact study is part of a policy review of Dutch involvement in sexual and reproductive health and rights (SRHR), roughly during the period 2007-2011, emphasizing the results that have been obtained. The Policy and Operations Evaluation Department (IOB) of the Dutch Ministry of Foreign Affairs is responsible for this work. The present evaluation is part of the assessment of bilateral cooperation programs. The study addresses the prevention and treatment of cervical cancer, a major reproductive health problem in Nicaragua. It focuses on remote rural areas where the local NGO 'Ixchen' - in collaboration with the Ministry of Health - has introduced a new approach for translating the right to reproductive health into practice. Both quantitative and qualitative research methods have been applied to identify the impact of this approach. The results of the study confirm that the interventions for screening and treating cervical cancer yield substantial net effects for treated clients, even while knowledge levels remain low.

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