Monterrey Health System's ANALYSIS:

Preparedness for Breast Cancer Care and Patient Experiences

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ABSTRACT

This study aimed to understand the available infrastructure of the main health services and describe the care pathways and experiences of women with breast cancer in the Monterrey Metropolitan Area. A review of different public registries was done to obtain general descriptive population data and breast cancer statistics for Mexico, the state of Nuevo León and the Metropolitan Area of Monterrey. For information on the available equipment and treatments in the main cancer institutions, key personnel of these institutions were interviewed. Qualitative interviews with 14 breast cancer survivors were done to document their care pathways and experiences from symptom discovery to diagnosis, treatment and current days. In these pathways, the focus was to understand the health services utilization experiences of patients with different types of health insurance coverage, and identify access barriers and facilitators. The study describes the breast cancer situation in Monterrey. It provides evidence of strengths and weaknesses of the MMA public health system in terms of epidemiological panorama of breast cancer, preparedness to offer the required medical services to an increasing BC patient population and experiences of patients in contact with these services.

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1 BACKGROUND

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A BREAST CANCER IN MEXICO

In Mexico, Breast Cancer is currently the main cause of cancer-related deaths among women.[1] Survival rates are much lower than in developed countries mainly due to cancer diagnosis in late stages.[2] For instance, while in the United States 60% of breast cancer cases are diagnosed in early stages (0 and I) with survival rates of 98%,[3] in Mexico only 5% of patients are diagnosed in these early stages and approximately 50% in advanced stages (III and IV) with survival rates of 7 to 36%[4].

B THE MONTERREY METROPOLITAN AREA

In Mexico, there are 59 metropolitan areas, which together represent 56.8 percent of the national population, with 63.8 million inhabitants. The vast majority of the urban population in Mexico resides in these metropolitan areas. The three largest metropolitan areas are those conformed in the surroundings of Mexico City, Guadalajara and Monterrey.[5]

The Monterrey Metropolitan Area includes Monterrey and 12 neighbor municipalities which together account for more than four million inhabitants (table 1). The state of Nuevo León has an estimated population of 4,653,458 and the majority (88.2%) resides in the Monterrey Metropolitan Area.[6]

TABLE 1. THE MONTERREY METROPOLITAN AREA

MUNICIPALITIES	POPULATION			AVERAGE ANNUAL POPULATION GROWTH (%)		AREA (KM²)	AUD[1] (HAB/HA)
	1990	2000	2010	1990-2000	2000-2010		
Monterrey Metropolitan Area	**2 671 715**	**3 381 005**	**4 106 054**	**2.4**	**1.9**	**6 794.0**	**109.1**
Apodaca	115 913	283 497	523 370	9.4	6.1	224.7	127.3
Cadereyta Jiménez	53 582	75 059	86 445	3.5	1.4	1 140.9	56.0
Carmen	4 906	6 644	16 092	3.1	8.9	104.4	43.4
García	13 164	28 974	143 668	8.3	16.8	1 032.1	104.2
San Pedro Garza García	113 040	125 978	122 659	1.1	-0.3	70.8	59.4
General Escobedo	98 147	233 457	357 937	9.1	4.2	148.9	113.0
Guadalupe	535 560	670 162	678 006	2.3	0.1	117.7	107.1
Juárez	28 014	66 497	256 970	9.1	14.0	247.3	112.3
Monterrey	1 069 238	1 110 997	1 135 550	0.4	0.2	324.8	107.7
Salinas Victoria	9 518	19 024	32 660	7.2	5.4	1 667.3	40.9
San Nicolás de los Garza	436 603	496 878	443 273	1.3	-1.1	60.2	116.5
Santa Catarina	163 848	227 026	268 955	3.3	1.7	915.8	126.5
Santiago	30 182	36 812	40 469	2.0	0.9	739.2	18.2

[1] AUD: Average Urban Densit

FIGURE 1. THE MONTERREY METROPOLITAN AREA

C BREAST CANCER IN MONTERREY

In the State of Nuevo León, BC is the main cause of cancer death among women older than 25 years of age. The state has high incidence and mortality rates of breast cancer, both above the national average. The reported mortality rate for 2008 was 24.3 per 100,000 female inhabitants older than 25, above the national average of 16.7.[7]

Even though there is no available data of breast cancer specific to Monterrey City and its Metropolitan Area, since 88% of the Nuevo León population resides in this area, it can be assumed that the vast majority of breast cancer cases that are diagnosed in the state occur in residents of the Monterrey Metropolitan Area. In 2008, 472 new cases were reported, according to the Ministry of Health.[7]

D THE MEXICAN HEALTH SYSTEM

The Health System in Mexico is fragmented into four main sectors:

1. social security medical services offered by different institutions for people with formal employment and their families,
2. the "popular health insurance" scheme (Seguro Popular) which was introduced in 2004 and is run by the Ministry of Health (MoH),
3. public health services offered by the MoH in exchange of income-related fees, and
4. private services.

The population affiliated to social security schemes accounts for 40% of the total Mexican population and is divided in different social security programs.[8] Financing of these social security institutions comes from a combination of contributions of employers and employees as well as federal government transfers. The type, coverage and quality of services available for the insured depend on the availability of resources in each social security institution.[9] Instituto Mexicano del Seguro Social (IMSS) is the largest of them, covering approximately 32% of the population.

The population affiliated to Seguro Popular (SP) accounts for another 25% of the total population.[8] SP is a basic health insurance package which to date covers 275 health interventions and 357 basic drugs and vaccines[10]. These interventions were defined giving priority to interventions related to health promotion, prevention and basic medical attention for the most common diseases. The program works through decentralized state health services and is financed by a central government contribution, a state contribution and a family contribution. Families that belong to the two lowest income deciles are exempted from this payment. They receive care mainly in health services dependent of the Ministry of Health, but sometimes also from private services that have an agreement with Seguro Popular.

The population that lacks any form of health insurance is entitled to receive health services directly offered by the MoH in exchange of fees that are determined according to the patient's socioeconomic status. Despite there being open access, a large part of the uninsured population, as well as that with SP, faces significant accessibility barriers and quality problems of health services available throughout the country.[8, 9]

Private services are heterogeneous in quality and the variety of services they offer, and their regulation by the Ministry of Health, governing organ of the health system, is limited.[9] Only about 2% of the population can afford private health insurance and it is common that these people are also entitled to use services at a social security institution.[8]

The majority of the uninsured population uses private services and pharmacies through out-of-pocket expenses[8], which have to be paid at the point of delivery. It is one of the most inequitable and inefficient forms of funding health care, since it has a much higher impact in the poorest households[11].

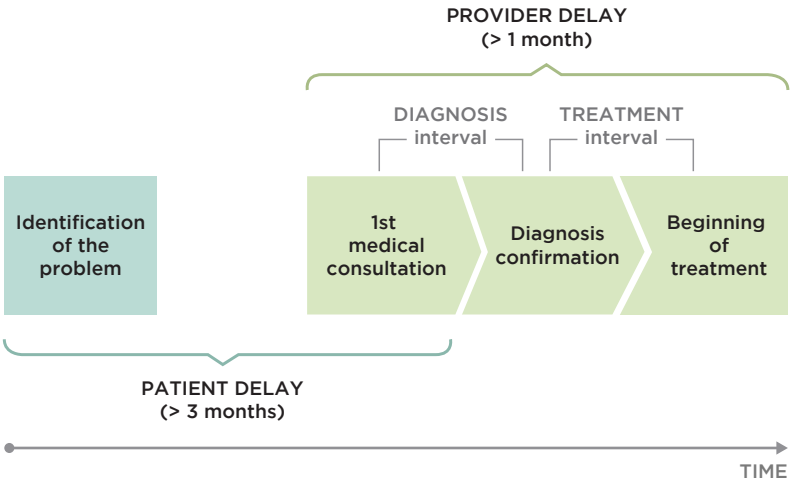
Since 2007, treatment expenditures for uninsured women with BC are being covered by a special federal fund for prevention of catastrophic medical expenditures, which is a complementary arm of Seguro Popular. However, this program does not cover medical expenses previous to a BC biopsy, and the difficulty to cover the costs of these studies can sometimes be an accessibility barrier for the socioeconomically disfavored.

E BREAST CANCER DELAY

Breast cancer delay (BCD) is defined in the literature as more than 3-months between symptom discovery and the beginning of definitive cancer treatment.[12, 13] Delays longer than 3-months have proven to be significantly associated with advanced clinical stage and worse rates of survival.[14]

Traditionally, it has been classified in two types: *patient and provider delay* **(figure 1). Patient delay** is considered as more than three months between the discovery of symptoms and the first medical consultation. In turn, **provider delay** is that which takes place between the first medical consultation and the beginning of definitive treatment, and the most accepted threshold is one month.

FIGURE 2.
TRADITIONAL CONCEPTUALIZATION AND CLASSIFICATION OF CANCER DELAY



Unger K & Infante C, 2011.

Despite the fact that in Mexico the majority of BC patients are diagnosed at stages III and IV,[4] there is insufficient research on the reasons behind delayed medical attention. Recent investigations in Mexico report a median time from identification of the problem to the beginning of definitive cancer treatment of 241 days, with a patient interval of 11.00 (IQR=82.00) days and a provider interval of 151.00 (248.00) days among BC patients treated at the Mexican National Cancer Institute, in Mexico City. Only 3% (8/322) of the BC patients that participated in this study began treatment in less than 3 months, and 63% (201/322) experienced delays greater than 6-months.[15]

A larger multicenter study that aims to quantify delays and identify the main reasons for delay has been taking place for the last 2 years in Mexico City. We are in the final phase of analyses, but preliminary data suggest that delay is mainly due to access barriers and substandard quality of accessible health services.[16, 17]

2 STATEMENT OF NEED

To improve the Monterrey Health System, it is first necessary to establish a diagnosis of the available infrastructure and quality of service delivery in public health services in Monterrey. This information is required to plan tailored measures directed to remove specific access barriers and enhance the health care system's capacity to provide quality BC care.

Although there is some obtainable data regarding available BC services in the MMA, this information is neither systematized nor easily accessible to the lay population. The systematization of data regarding the MMA public health system's resources for early detection, diagnosis, treatment and rehabilitation of BC patients in this project allowed identification of areas of opportunity to improve the health system's capacity for BC care.

On the other hand, the documentation of the magnitude of provider delay for BC treatment in one of the main public hospitals of the MMA and the care pathways that patients covered with different health insurance schemes go through provide useful evidence of the way health services for breast cancer work.

3 GOAL AND OBJECTIVES

goal

To have a detailed diagnosis of the available infrastructure for breast cancer care in the Monterrey Metropolitan Area and the time intervals from arrival at a cancer institution and the beginning of cancer treatment.

objectives

1. Describe population and breast cancer statistics of the MMA and compare them with the rest of the state of Nuevo León and the country.

2. Understand the healthcare pathways that breast cancer patients go through from the first symptoms or abnormal screening tests until the end of treatment, in the main types of cancer services available in the MMA.

4 METHODS

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This is a descriptive study that combines the use of quantitative and qualitative methods. ***Table 2*** summarizes the type of data that was collected for each objective, as well as the methods used to collect it.

A DATA COLLECTION

For documentation of general population and breast cancer statistics of Mexico, Nuevo León and in particular the MMA, data was acquired through public records of INEGI (Instituto Nacional de Estadística, Geografía e Información), CONAPO (Consejo Nacional de Población) and SINAIS (Sistema Nacional de Información en Salud).

The second objective was not considered in the first proposal, as such. It was originally planned to obtain specific quantitative data regarding available services for early detection, diagnosis, and care of BC patients. As this was not possible for all public institutions because the institutional authorities did not authorize to share this information, we decided to compensate in this way. We obtained patient narratives of their experiences with breast cancer care from the discovery of first symptoms, help-seeking behavior, contact with health services to get medical attention, diagnosis, treatments and their perceptions of accessibility issues and medical care satisfaction. This allowed a better understanding of the way the system works, and the access barriers that the patients go through to get treated. Informal interviews with key informants that work in the main public cancer hospitals of the MMA helped us complement our understanding of these care pathways.

TABLE 2. OBJECTIVES, DATA AND METHODS

OBJECTIVES	DATA	DATA ACQUISITION METHODS
1. Describe population and breast cancer statistics of the MMA and compare them with the rest of the state of Nuevo León and the country.	Breast cancer statistics in Mexico, Nuevo León and MMA.	Data acquisition through public records: INEGI, CONAPO and SINAIS.
	Population covered by different types of public health insurance in Mexico, Nuevo León and MMA.	
	Marginalization data for Mexico, Nuevo León and MMA.	
2. Understand the pathways that breast cancer patients go through from the first symptoms or abnormal screening tests until the end of treatment.	Available services for BC early detection in MMA.	Interviews with key personnel at the main public institution of the MMA: Hospital Metropolitano, IMSS (Instituto Mexicano del Seguro Social), and ISSSTE.
	Available services for BC diagnosis in MMA.	
	Available services for BC treatment in MMA.	14 Qualitative interviews with BC patients that have finished treatment or are currently being treated at different types of institutions in the MMA.
	BC patients' help-seeking and medical care trajectories.	

B DATA ANALYSIS

For categorical variables absolute frequencies and percentages were calculated, and for numerical variables central tendency and dispersion estimations were estimated.

For the qualitative phase of the study (second objective), health care pathways were elaborated for each of the three main types of services: those available for the uninsured and for patients with Seguro Popular, those available for people covered with social security schemes, and private health care services. Health services utilization trajectory diagrams were elaborated for each of the interview participants. In these diagrams, the main health care events are presented in a chronological fashion with estimated dates of their occurrence (as recalled by the patient) and barriers to timely care that were identified in the participants' narratives. Furthermore, relevant extracts were obtained from the interviews to exemplify relevant aspects of the participants' experiences.

C ETHICAL ISSUES

The research protocol was approved by the ITESM Scientific and Ethical Boards. For the patient interviews, informed consent was taken of each participant and consent forms signed. The project aims and participation were explained to each participant before the interview took place. The interviews took place in a private room in Cimab Monterrey, and to keep the confidentiality agreement done with each of them, pseudonyms were used to identify the informants throughout the research process.

D COLLABORATION OF ORGANIZATIONS

As the lead organization, **Cimab's** role in this project was that of conceiving the idea, designing the project, writing the grant proposal, coordinating the project, designing the required instruments and databases, recruiting and training the necessary personnel, and finally the data analysis and elaboration of the final report. The collaboration with ***Médicos por el Cáncer*** and ***ITESM*** in this project facilitated the participation of medical residents that did parts of this project in order to use the data for their thesis. A couple of residents elaborated each a research protocoL which was approved by ITESM, and were then in charge of directly collecting data.

5 RESULTS

A DESCRIPTIVE STATISTICS OF THE MONTERREY METROPOLITAN AREA (MMA)

Nuevo León is one of the most developed states of the country, among those with the highest economic productivity, and the least proportion of uninsured and of highly marginalized population. **Table 3** summarizes general descriptive statistics of the population for the entire country and for the state of Nuevo Leon, to allow comparison between them.

TABLE 3. POPULATION AND BREAST CANCER STATISTICS OF MEXICO AND NUEVO LEON

	MEXICO		NUEVO LEON	
	Num.	%	Num.	%
Population size (total)	**112,336,538**		**4,653,458**	
Women	57,481,307	51.2	2,333,273	50.1
Men	54,855,231	48.8	2,320,185	49.9
Population by age groups				
Less than 20 years	43,541,908	38.5	1,665,681	35.8
20 – 29 years	18,680,448	16.6	785,809	16.9
30 – 39 years	16,763,785	14.9	767,093	16.5
40 – 49 years	12,937,956	11.5	581,614	12.5
50 – 59 years	8,959,656	8.0	382,941	8.2
60 – 69 years	5,433,731	4.8	229,410	4.9
70 years and older	4,621,648	4.1	177,868	3.8
Unspecified	1,397,406	1.2	63,042	1.4
Health care insurance	**74,321,995**	**66.2**	**3,698,422**	**79.5**
IMSS[1]	35,211,846	31.3	2,601,851	55.9
Seguro Popular	26,558,908	23.6	495,422	10.7
ISSSTE[2]	6,366,321	5.7	135,758	2.9
Private insurance	3,107,316	2.8	307,479	6.6
PEMEX, SEDENA o SEMAR3	1,130,977	1.0	22,993	0.5
ISSSTE Estatal[4]	994,293	0.9	36,154	0.8
Other institutions	2,037,783	2.7	165,062	3.6
Breast Cancer Incidence Rate[5]	**14.0**		**20.2**	
Breast Cancer Mortality Rate[5]	**16.6**		**22.4**	
Breast Cancer new cases	**8072**		**472**	

[1] IMSS: Instituto Mexicano del Seguro Social (services for people working in private companies).
[2] ISSSTE: Instituto de Servicios de Seguridad Social para Trabajadores del Estado (services for people working in federal public institutions)
[3] PEMEX: services for people working in Petróleos Mexicanos (the public oil industry); SEDENA: Secretaría de la Defensa Nacional, services for the military; SEMAR: Secretaría de Marina, services for the marines.
[4] ISSSTE Estatal: services for people working in public institutions that belong to each state.
[5] Rates are estimated per 100,000 women.
** Elaborated by the author based on data from INEGI, 2010 Census; breast cancer information was obtained from SUIVE, 2008.*

As it can be observed, the state has a similar composition than that of the entire country in terms of sex and age of the population. But it is very different in terms of health insurance coverage and breast cancer statistics. The proportion of the Nuevo Leon population that is covered by some kind of public health insurance is 13% higher than that of the national population (**table 3**). The vast majority of those covered by public health insurance are covered by a formal regime, which is only available for people with formal employment. Only 10.6% of the Nuevo Leon population is covered by Seguro Popular, which is available for people that usually lack formal employment and therefore generally live in more vulnerable socioeconomic conditions, in comparison to the 23.7% national proportion of Seguro Popular affiliates. Finally, both the incidence and mortality rates of breast cancer in Nuevo Leon are higher than the national average.

TABLE 4. HEALTH INSURANCE COVERAGE AND MARGINALIZATION IN THE MONTERREY METROPOLITAN AREA

	TOTAL POPULATION	POPULATION COVERED BY PUBLIC HEALTH INSURANCE	PROPORTION OF THE POPULATION BY DEGREES OF MARGINALIZATION				
			VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH
National[a]	**111,855,519**	**74,321,995 (66.2)**	**14,595,914 (13.0)**	**24,104,443 (21.5)**	**19,353,872 (17.2)**	**14,248,464 (12.7)**	**7,497,281 (6.7)**
Nuevo León	4,653,458	3,698,422 (79.5)	1,863,559 (40.0)	1,393,508 (30.0)	525,390 (11.3)	162,478 (3.5)	22,444 (0.5)
MMA	4,102,496	3,145,886 (76.7)	3,999,175 (97.48)	61,326 (1.49)	22,570 (0.55)	18,482 (0.45)	943 (0.02)
Apodaca	523,246	420,271 (80.3)	521,308 (99.6)	1,794 (0.3)	43 (0.01)	101 (0.02)	0
Cadereyta Jiménez	84,806	66,085 (77.9)	70,447 (83.1)	5,712 (6.7)	5,025 (5.9)	3,622 (4.3)	0
Carmen	15,812	13,032 (82.4)	11,431 (72.3)	70 (0.4)	4,022 (25.4)	289 (1.8)	0
Escobedo	357,920	272,261 (76.1)	353,659 (98.8)	19 (0.01)	1,479 (0.4)	2,745 (0.8)	18 (0.01)
García	143,559	115,616 (80.5)	138,866 (96.7)	205 (0.1)	1,248 (0.9)	2,642 (3.1)	598 (0.4)
Guadalupe	677,968	516,329 (76.2)	677,681 (100.0)	0	0	287 (0.04)	0
Juárez	256,741	200,726 (78.2)	209,336 (81.5)	42,818 (16.7)	2,942 (1.2)	1,619 (0.6)	26 (0.01)
Monterrey	1,135,512	837,548 (73.8)	1,135,512 (100.0)	0	0	0	0
Salinas Victoria	32,102	23,766 (74.0)	9,666 (30.1)	9,853 (30.7)	7,023 (21.9)	5,546 (17.3)	14 (0.04)
San Nicolás de los Garza	443,273	349,660 (78.9)	443,273 (100.0)	0	0	0	0
San Pedro Garza García	122,627	90,549 (73.8)	122,627 (100.0)	0	0	0	0
Santa Catarina	268,884	207,921 (77.3)	268,347 (99.8)	192 (0.1)	0	0	0
Santiago	40,046	32,122 (80.2)	37,022 (92.4)	663 (1.6)	0684 (1.7)	1,515 (3.8)	162 (0.4)

** Elaborated by the author based on data from CONAPO. Marginalization Index by Locality, 2012, which is based on data from INEGI, 2010 National Population Census.*
[a] This is not the total Mexican population due to the fact that the marginalization index is not available for 84,756 localities with a population of 509,081 people, for which information is lacking.

Table 4 presents information regarding health insurance coverage and degree of marginalization of the population that resides in the Monterrey Metropolitan Area (MMA), by municipality. This information is also presented for the entire country and for the state of Nuevo Leon for comparison.

The National Population Council (Consejo Nacional de Población, CONAPO) measures marginalization as an index intended to quantify the amount of people in a geographic entity that live in a situation of lack of opportunities for development and lack of capacity to find these opportunities.[18] CONAPO's marginalization index is estimated for each locality based on data obtained from the National Census1. For the index estimation, three dimensions are considered: education, dwelling and assets.

The education dimension is incorporated through two indicators: proportion of illiteracy among the 15-year and older population and percentage of 15-year and older population that did not complete elementary school studies. For the dwelling dimension, the indicators included in the marginalization index are: percentage of homes that lack a toilet, proportion of houses that lack electricity, proportion that lack piped water, average of home occupants per room and proportion of houses with a floor of soil. Finally, for the assets dimension, the indicator considered in the index is the percentage of homes that lack refrigerator. These 8 indicators are combined in a composite index, to categorize each locality and the people living in it in one of 5 categories, from very low to very high marginalization.[18]

As it can be seen, in Nuevo León 70% of the population resides in localities with very low and low marginalization and only 4% in areas of high to very high marginalization. In contrast, only 34.5% of the national population lives in areas with very low and low degrees of marginalization, and 19.4% in regions of high to very high marginalization. Marginalization is even less in the Monterrey Metropolitan Area (MMA), with more than 97% residing in localities of very low marginalization and less than 1% in localities of high to very high degrees of marginalization (**table 4**). The MMA municipalities are then presented separately. It can be noted that even though in general terms there is low marginalization in all of them, the municipalities with higher marginalization are, in the following order: Salinas Victoria, Cadereyta, Santiago and Garcia.

In regard to health insurance coverage, while Nuevo León's coverage is higher than the national proportion, there is still 20.5% of the state's population that lacks health insurance. Proportions for each municipality of the MMA are similar to this, between 17.6% (Carmen) and 26.2% (Monterrey).

[1] *The last National Census took place in 2010, and data are available through INEGI's website: www.inegi.org.mx.*

B CARE PATHWAYS OF BC PATIENTS IN THE MAIN MMA HEALTH SERVICES

14 participants were interviewed, all of them women who had Breast Cancer. All candidates accepted a telephone invitation and were then cited on a specific date and time that was convenient for them in Cimab. Once there, the principal investigator explained the study in detail and informed consent was taken. All candidates agreed to the interview. The basic sociodemographic, health insurance and institutions were they received BC treatment are summarized in **table 5**.

Each participant narrated freely her health care seeking trajectory from the moment she first identified there was a problem in her breast, up until the moment of the interview. A trajectory was elaborated for each participant, which organizes chronologically the main health care events and barriers identified in the interview analysis. Based on these trajectories, and complemented with information obtained through medical informants that work in the institutions involved, care pathways were also elaborated for each of the main types of health insurance. Results of this section are organized in four sub-sections, each conformed by a model of the care pathway for patients under that kind of health insurance scheme and then specific patient trajectories that help exemplify the pathway under analysis.

TABLE 5. CHARACTERISTICS OF QUALITATIVE INTERVIEWS PARTICIPANTS

NO.	PSEUDONYM	AGE	YEAR OF DIAGNOSIS	EDUCATION (YEARS)	OCCUPATION	HEALTH INSURANCE	HOSPITAL WHERE TREATED
1	**Esmeralda**	41	2012	12	Housewife	Seguro Popular	HM/HU
2	**Lupe**	36	2012	9	Housewife	Seguro Popular	HM/HU
3	**María**	37	2012	9	Housewife	Seguro Popular	HU
4	**Jovita**	77	2011	0	Cosmetics saleswoman	Seguro Popular	HM/HSJ
5	**Bellina**	49	2010	12	Seamstress	Seguro Popular	HM/HU/HSJ
6	**Laila**	65	2011	4	Housewife	Seguro Popular	HU/HSJ
7	**Celia**	55	2010	11	Machine operator	IMSS	IMSS
8	**Ernestina**	50	2005	6	Vitamins saleswoman	IMSS	IMSS
9	**Gabriela**	50	2011	16	School prefect	ISSSTE	ISSSTE/IMSS
10	**Teofila**	57	2011	6	Housewife	Municip. Serv./IMSS	HU
11	**Camila**	54	2010	16	Pensionary	Municip. services	HU
12	**Benita**	53	2012	9	Librarian	Municip. services	Private services
13	**Cleotilde**	41	2012	16	Credit card manager	Private	HSJ + Private services
14	**Guadalupe**	64	1992&2006	16	Business administrator	Private	HSJ + Private services

** Municip. Serv. : Municipality health services, IMSS: Instituto Mexicano del Seguro Social (Mexican Institute of Social Security), ISSSTE: Instituto de Seguridad y Servicios Sociales para Trabajadores del Estado (Institute of Security and Social Services for Workers of the State).*

As a complement, to allow a better understanding of the care pathways that will be later on explained, **tables 6** and **7** summarize the diagnostic and treatment options that are available in the main public hospitals that offer cancer services in the MMA.

TABLE 6. RESOURCES FOR DIAGNOSIS OF BREAST CANCER IN THE MAIN PUBLIC HEALTH SERVICES OF MMA

MEDICAL CENTERS	MAMMOGRAPHY	BREAST ULTRASOUND	INCISIONAL BIOPSY	OPEN BIOPSY	STEREOTACTIC BIOPSY	PATHOLOGIST ON SITE
Ministry of health						
Hospital Materno-Infantil	☐	☐	☐	☐	☐	–
Hospital Metropolitano	☐	☐	☐	☐	☐	☐
Hospital Universitario	☐	☐	☐	☐	☐	☐
IMSS						
UMAE 23	☐	☐	☐	☐	–	☐
UMAE 25	☐	☐	☐	☐	☐	☐
ISSSTE						
Clinica Hospital (Constitución)	☐	☐	☐	☐	–	☐
Hospital Regional	☐	☐	☐	☐	☐	☐

TABLE 7. AVAILABLE TREATMENT MODALITIES OF BREAST CANCER IN THE MAIN PUBLIC SERVICES OF MMA

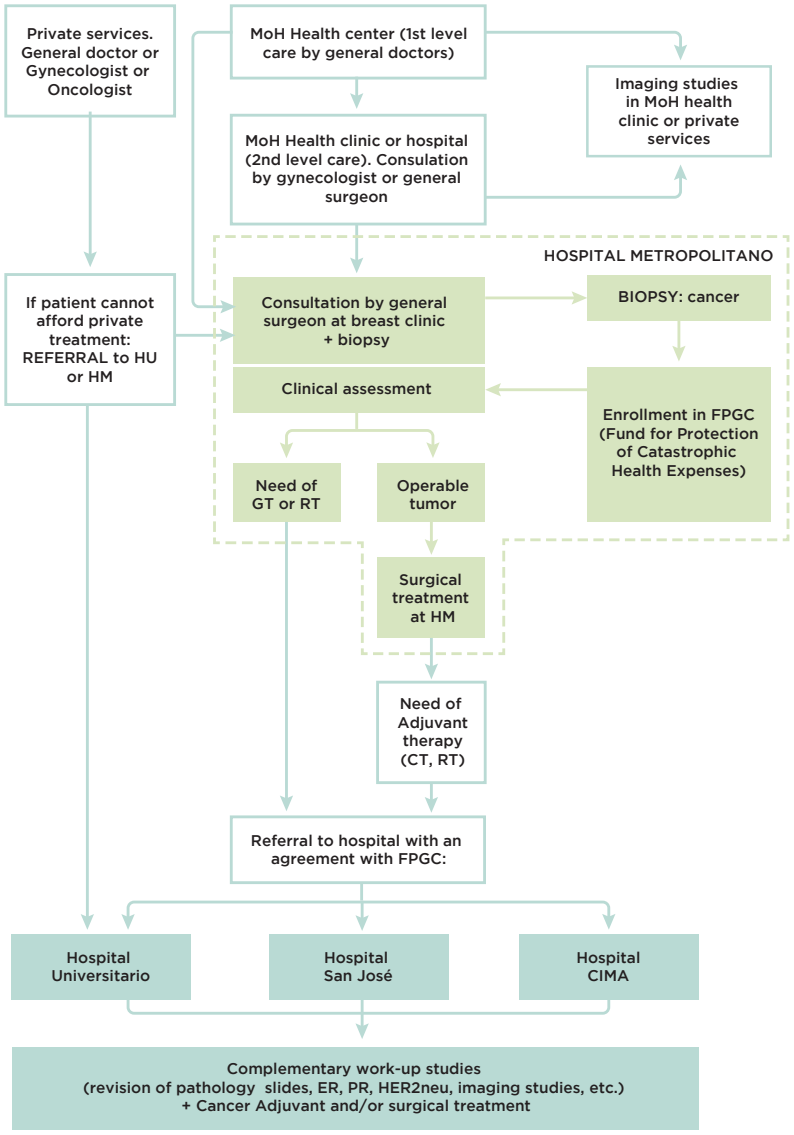
MEDICAL CENTERS	MASTECTOMY	BREAST CONSERVING SURGERY	SENTINEL NODE BIOPSY	CHEMO-THERAPY	RADIO-THERAPY	HORMONAL THERAPY	BIOLOGIC THERAPY
Ministry of health							
Hospital Materno-Infantil	☐	–	–	–	–	–	–
Hospital Metropolitano	☐	☐	☐	–	–	–	–
Hospital Universitario	☐	☐	☐	☐	☐	☐	☐
IMSS							
UMAE 23	☐	☐	–	–	–	–	–
UMAE 25	☐	☐	–	☐	☐	☐	☐
ISSSTE							
Clinica Hospital (Constitución)	☐	☐	–	–	–	–	–
Hospital Regional	☐	☐	–	☐	–	☐	☐

1 CARE PATHWAYS FOR UNINSURED PATIENTS OR PATIENTS WITH *SEGURO POPULAR*

Figure 3 summarizes the most common pathways for uninsured patients and those covered by Seguro Popular to obtain cancer care. Patients that lack any form of health insurance and cannot afford private care, are entitled to use health services offered by the Ministry of Health in exchange of low fees. Patients affiliated to Seguro Popular are also entitled to use these same services, but they don't have to pay out-of-pocket for services covered by Seguro Popular.

In the case of breast cancer, Seguro Popular covers breast clinical examination and in some entities it also covers screening mammography (but not in all). Diagnostic imaging breast studies are not covered by Seguro Popular, and therefore have to be paid by the patients through out-of-pocket. By Law, any person that is diagnosed with breast cancer (with biopsy evidence) and is either uninsured or affiliated to Seguro Popular, is entitled to receive breast cancer treatment without cost through the Fund of Protection for Catastrophic Health Expenses (FPGC). The biopsy itself is only covered by FPGC if it turns out to be positive. Although as we will see later on in the qualitative results, patients do not always know about this and they end up paying the biopsy and part of the treatment themselves.

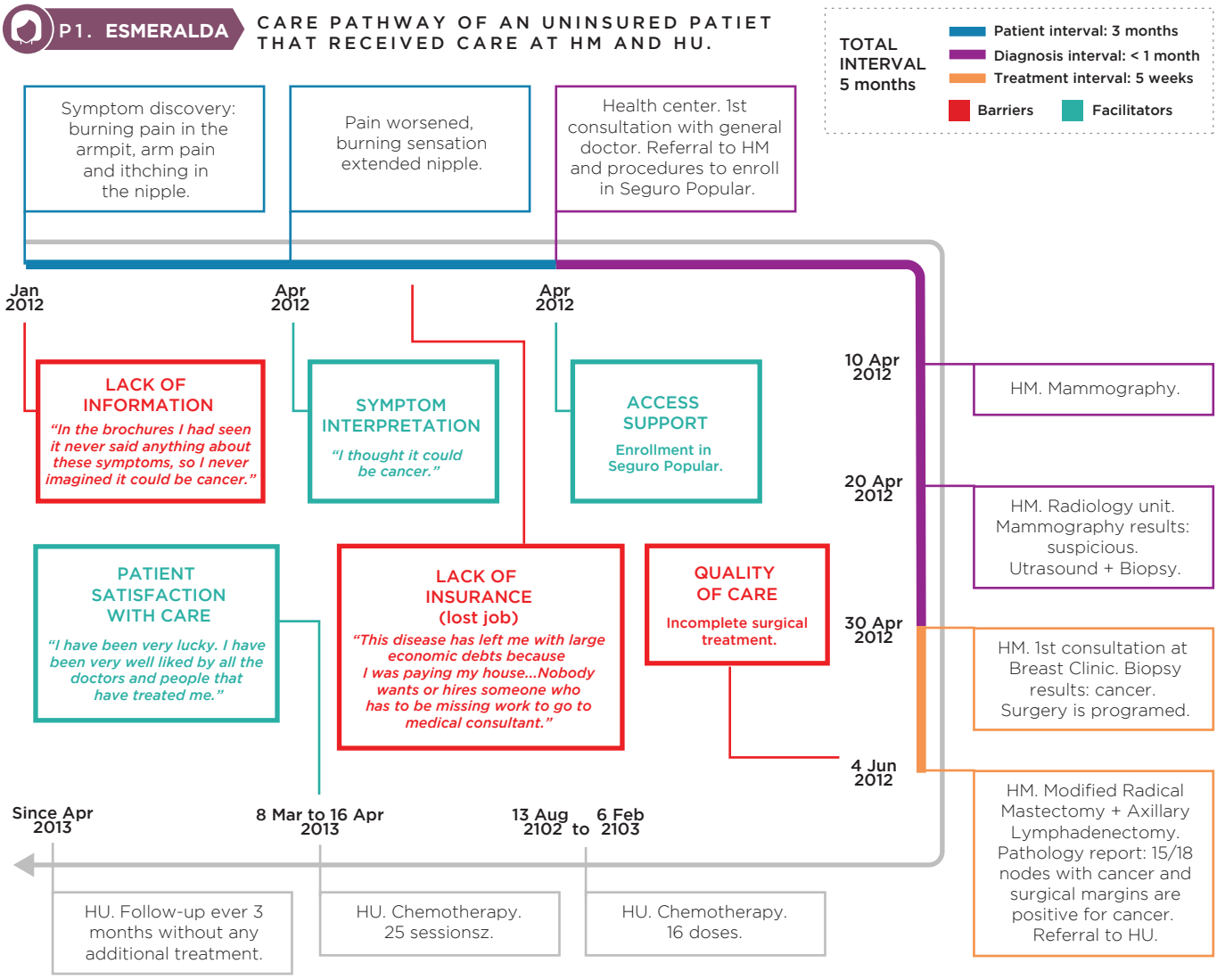
FIGURE 3. CARE PATHWAYS FOR UNINSURED PATIENTS AND PATIENTS WITH "SEGURO POPULAR"



To enter the system for cancer treatment covered by the FPGC, the patient has to be referred to one of the third level institutions that have an agreement with the program. For this to happen, patients usually have to go through Hospital Metropolitano (HM). "Hospital Metropolitano Bernardo Sepúlveda" (HM) is a general hospital that offers second level care and some third level care services for the uninsured population at low fees and for free to those covered by Seguro Popular. It is located in the municipality of Monterrey. For breast cancer care, it offers mammography screening services, diagnostic mammography and ultrasound, biopsy procedures and surgical treatment (**tables 6** and **7**).

If a patient requires chemotherapy, radiotherapy and/or hormonal therapy, they are most commonly referred to Hospital Universitario (HU), which is a third level care hospital independent of the Ministry of Health that has long offered services to patients referred from services of the Ministry of Health (even before Seguro Popular existed). Patients that lack insurance have to cover their care expenses, although the fees are much lower than in private hospitals, until they are admitted to the Seguro Popular's Fund for Protection of Catastrophic Health Expenditures. In the last two years, Hospital San José and more recently Hospital CIMA, both prestigious private hospitals, have established agreements with Seguro Popular to offer cancer treatment for uninsured patients referred by Hospital Metropolitano.

The main barriers to care seem to occur before arrival to the Metropolitan Hospital, as there is not an established and clear referral route that patients can follow. Rather, they search for an available health service they can access and afford, until they eventually get referred to either HM or HU. The pathways of care before reaching tertiary care services can be very variable. The official desirable pathway would be that the patient consults a health center dependent of the Ministry of Health and she is immediately referred to a breast clinic or directly to HM. But, since care received in the health centers is not always accessible, it is very much up to the patient (the information, economic resources and social support she has) where to seek help. Then accessibility and quality of care at the consulted services will influence the timeliness of her referral to cancer services.

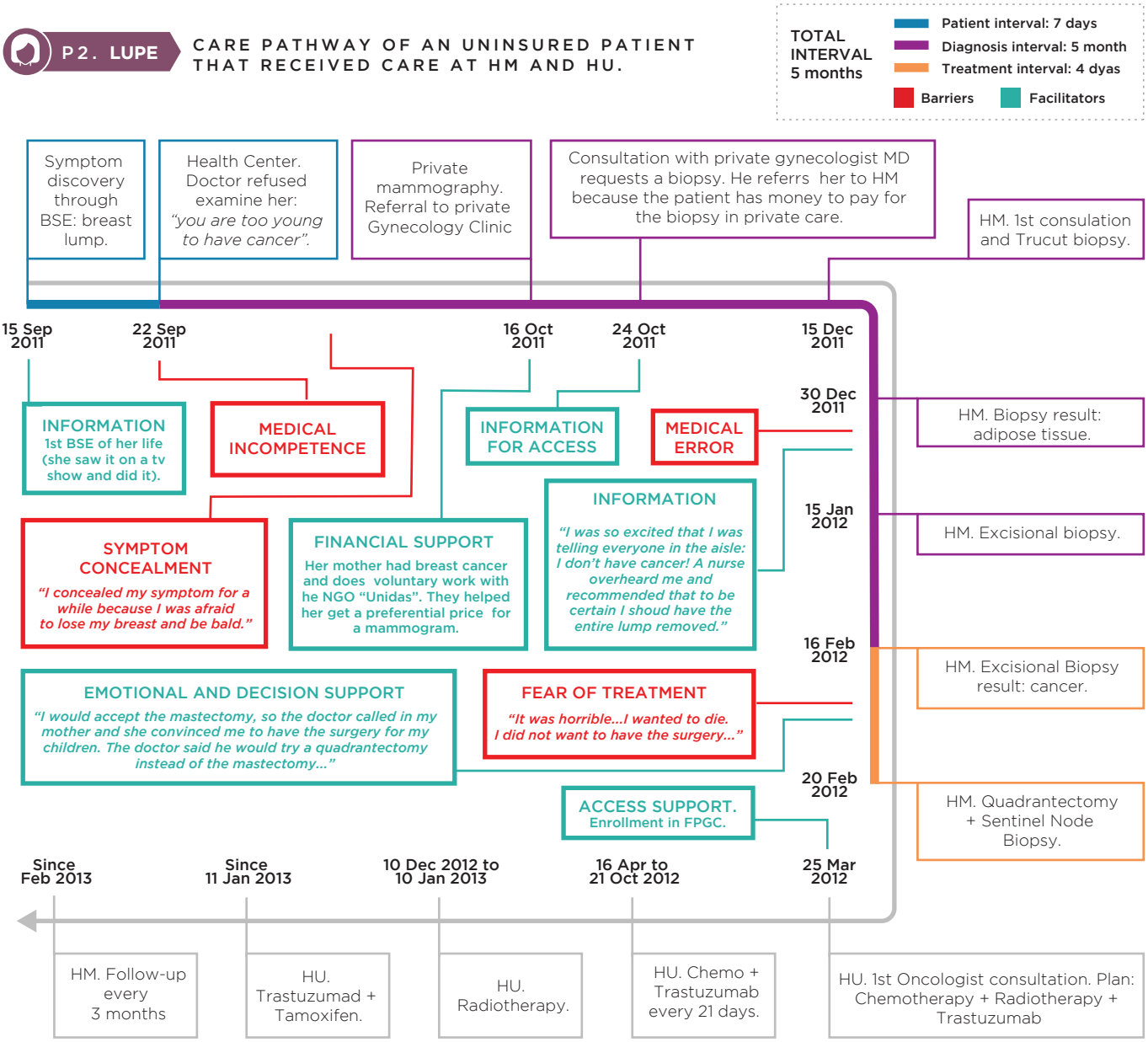


In the patient trajectories examples it is possible to observe the variety of services consulted before arrival to HM and HU. The patient trajectories are organized in a chronological fashion with the most relevant medical events along the timeline in black boxes. In each trajectory time is represented by the black arrow that begins in the upper left corner, continues to the right, then goes downwards and ends in the bottom left corner. The total, patient and provider intervals are estimated and illustrated within each patient trajectory. Barriers identified in the patient narratives are shown in red, and facilitators or accelerators of materialization of medical care are shown in green.

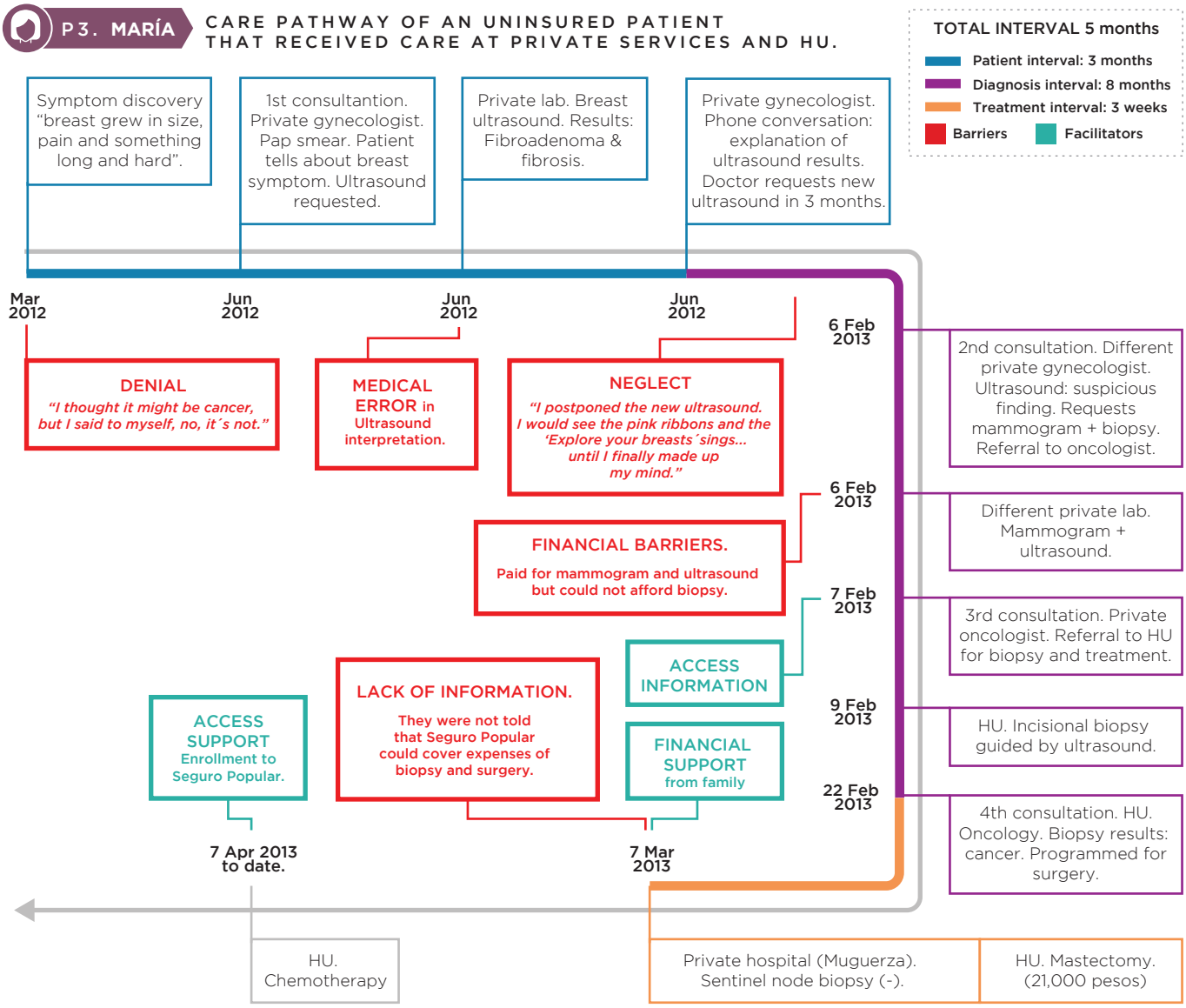
The first two patient trajectories (**P1** and **P2**) have similar total delay times of 5 months, but the main sources of delay seem to be very different. While Esmeralda (**P1**) delayed seeking care

apparently because of ignorance in regard to breast cancer symptoms other than a lump, Lupe (**P2**) sought care immediately but faced barriers of medical incompetence or negligence at the first medical service she tried to consult, and then a medical error in the first biopsy.

Lupe also (**P2**) faced personal barriers of fear and concealment that could have led to more delay than there actually was in her case. Apparently the social support she received through information, advice, help in decision-making and emotional support, played a very important role to overcome her fear of treatment and deciding to do it.

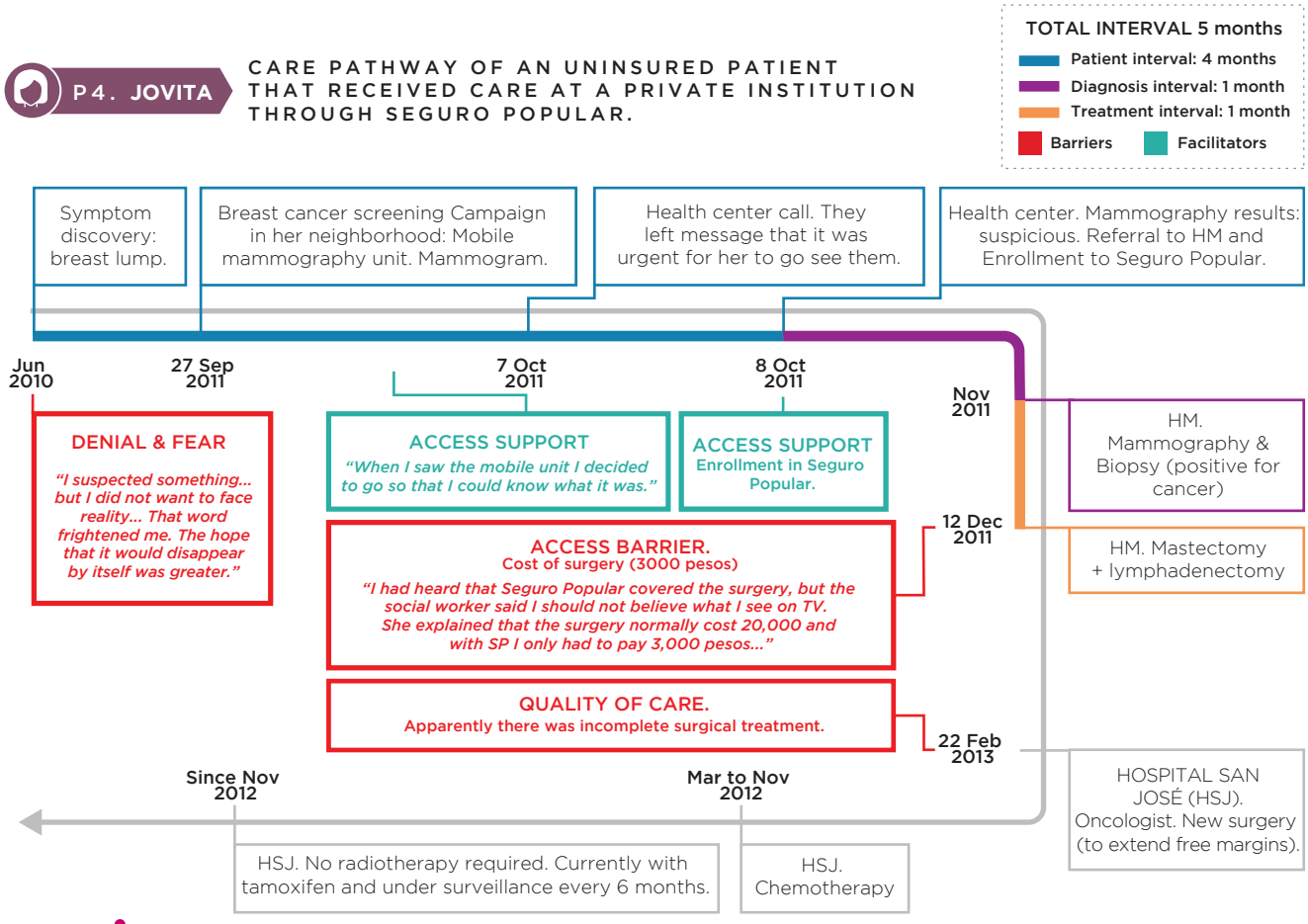


The third pathway shown (**P3**) exemplifies a different pathway of an uninsured woman that received treatment at HU, but without first going through HM. Actually she used private services, although she is not wealthy. She is a housewife and her husband works in construction in eventual jobs, and therefore they both lack health insurance. The private services that people with limited resources can access may be of variable quality. In her case there was a clear miss-interpretation of the first breast ultrasound, which then combined with her postponement of follow-up, contributed to a severe delay that most probably caused the cancer to advance. Financial barriers eventually made it impossible for her to continue care in private services, and finally an ethical private doctor gave her the information of a public institution where she could receive care at lower prices (HU).



Trajectory of patient 4 (Jovita) is one where the main component of delay occurred previous to the first contact with the health care services. Jovita was in denial about her breast lump discovery for a few months and postponed seeking care because of fear. Nevertheless, it is a good example of how bringing a health service closer to the patient can enhance their use. When she saw the campaign close to her neighborhood she decided to get a mammogram and finally started health care utilization.

It is a shame though that in Lupe, Maria and Jovita's cases (P2, P3 and P4), they were not told about their rights to enroll to FPGC since the biopsy. They had to cover expenses of biopsy and surgery, and were enrolled in the program until they were about to begin Chemotherapy. Jovita did try to get FPGC to cover her surgery expenses because she had hear about Seguro Popular covering the entire treatment, but it seems to be an institutional practice to charge the patients for surgical treatment, even if they have Seguro Popular. For people with limited resources, as them, even though they were charged low fees in comparison to a private hospital, it may be quite an effort to cover these expenses and could therefore act as a potential barrier to receive treatment.



It is noteworthy that in all four cases, there were different kinds of problems in relation to quality of care. In the case of Lupe (P2) there was medical negligence at the first health center where she consulted, where the doctor refused to examine her and discarded cancer as a possible diagnosis due to her young age, and later on there was a medical error in the first biopsy taken. Thanks to the intervention of a nurse that must have experience with similar cases of inconclusive biopsies, this patient did not experience an even greater delay in diagnostic confirmation. But the physician that consulted her in the Breast Clinic of Hospital Metropolitano (most probably a resident) had already discharged her with a benign diagnosis. Maria (P3) had most likely an erroneous ultrasound interpretation that, added to her denial and self-neglect, caused additional delay by giving her false reassurance of a benign diagnosis. Finally, both Esmeralda (P1) and Jovita (P4) had incomplete surgeries and had to be submitted to a second intervention to guarantee tissue cancer-free margins.

2 CARE PATHWAYS FOR PATIENTS COVERED BY SOCIAL SECURITY SCHEMES

Six of the qualitative interviews participants were covered by some sort of social security scheme: two with IMSS, one with ISSSTE and three more with health insurance offered by the Municipality where they live. This last scheme is less common and is offered to employees of the Municipality and their families. Each municipality has health services of their own for their employees, which is usually basic medical care. When specialized care is necessary, they pay other institutions (with which they have agreements) for these services. It seems to depend on the municipality, on where these specialized services are provided. For instance, in the cases of P10 and P11, they were both treated at the University Hospital, with expenses covered by their corresponding Municipality services. Instead, for P12 who works in San Pedro Garza García (the richest municipality of the Monterrey Metropolitan Area), her services were offered in private institutions. Since the pathways of these last patients are similar to those offered to patients covered with Seguro Popular (P10 and P11) and to those treated in private services (P12), these trajectories will not be discussed in detail.

Both the IMSS and ISSSTE care pathways are similar in terms that they have well established routes of first, second and third level care services. **Figure 4** summarizes the care pathway of cancer patients covered by IMSS in the Monterrey Metropolitan Area, and **figure 5** that of patients covered by ISSSTE services.

FIGURE 4. CARE PATHWAYS FOR PATIENTS COVERED BY IMSS

IMSS (Instituto Mexicano del Seguro Social). Scheme available for people with formal employment in the private sector.

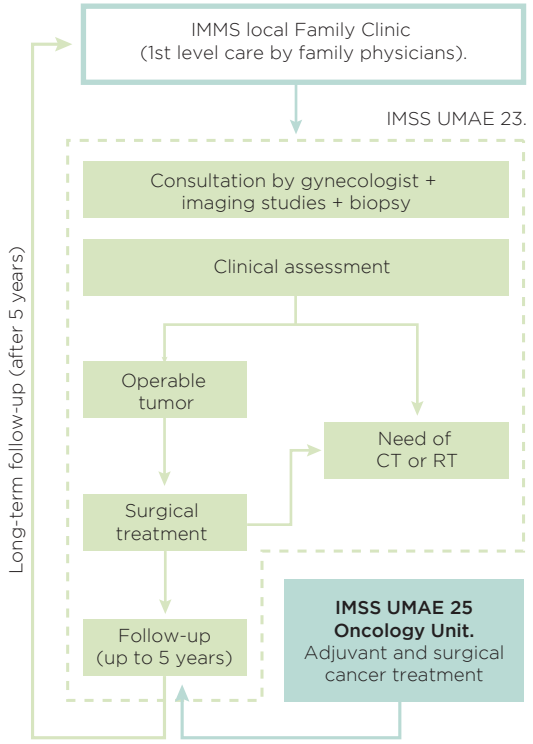
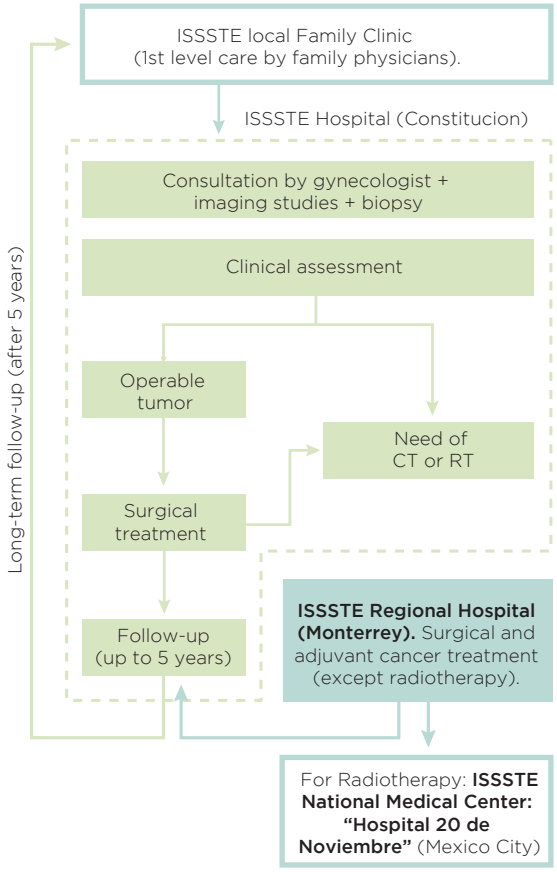


FIGURE 5. CARE PATHWAYS FOR PATIENTS COVERED BY ISSSTE

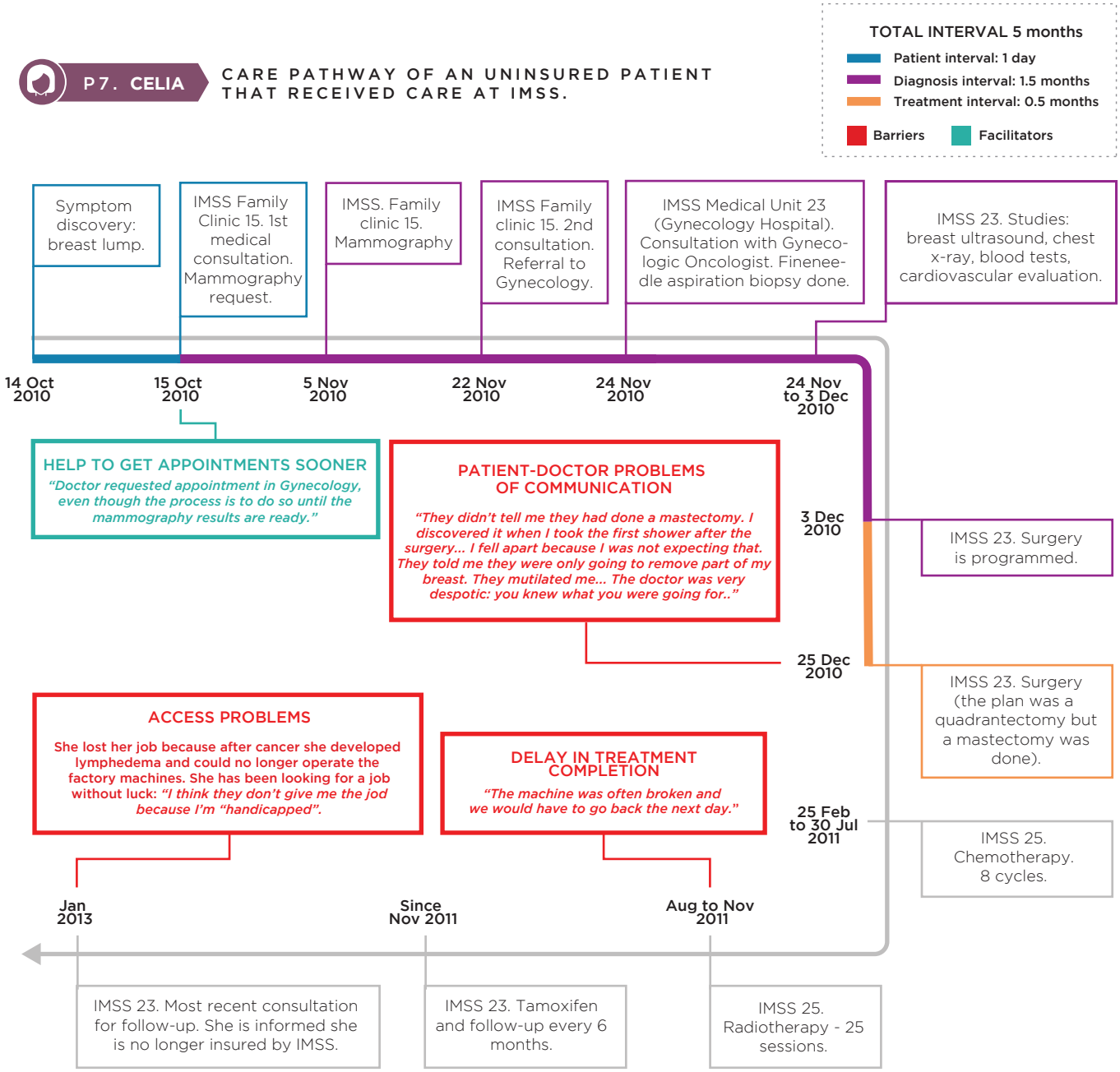
ISSSTE (Instituto de Servicios de Seguridad Social para Trabajadores del Estado). Scheme available for people with formal employment in the public sector.

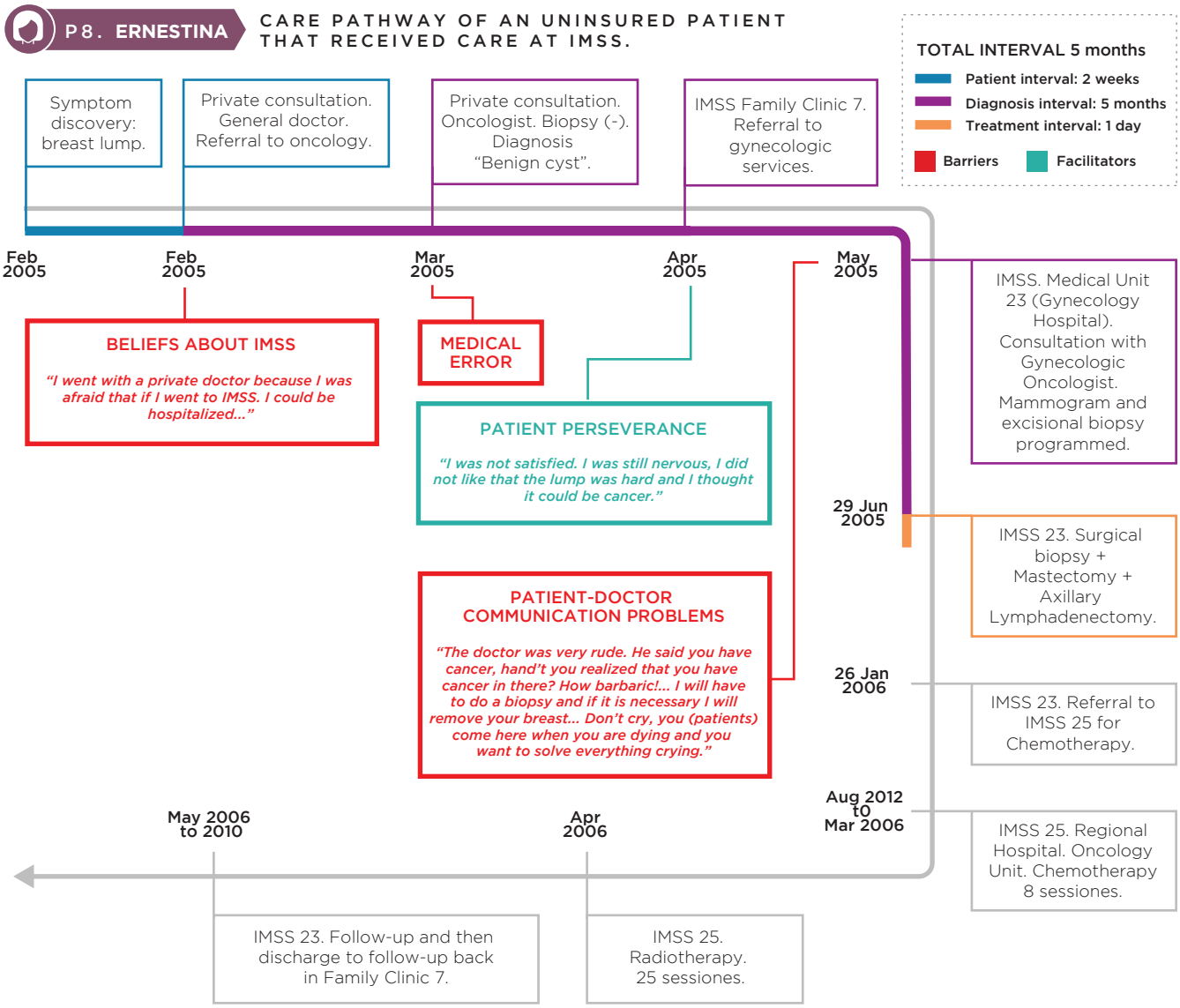


The trajectories of P7 and P8 exemplify the care pathway summarized in figure 4. As it can be seen, access is easier in terms of where to go because the referral routes are defined institutionally. The main access issues for patients covered with IMSS are related with the saturation of the health services for this population, and therefore long times between appointments. Although, as it may be seen in the trajectory of Celia (P7), doctors also may help to shorten these times. In her case, it seems like the first family doctor she consulted suspected she could have cancer and in order to help accelerate medical attention he ordered a mammogram and simultaneously referred her to gynecology. This because he knows that appointments in the Hospital of Gynecology usually take long. In the case of Ernestina (P8) she first consulted a private doctor, because she was afraid that if she went to IMSS, she could be hospitalized. This probably also guaranteed faster access to a doctor. Nevertheless, once again we have an example of a medical error with a negative biopsy that ends in discharge of the patient.

Another access problem that is noted in the patient trajectories is the long times to complete radiotherapy. In the case of Celia (P7), it took her 3 months to complete 25 sessions of radiotherapy because the machine was often broken.

She still had to go everyday from Monday to Friday to see if the machine worked that day. A doctor of IMSS that was interviewed recognized that Radiotherapy equipment often breaks down because "it is used for too many patients".

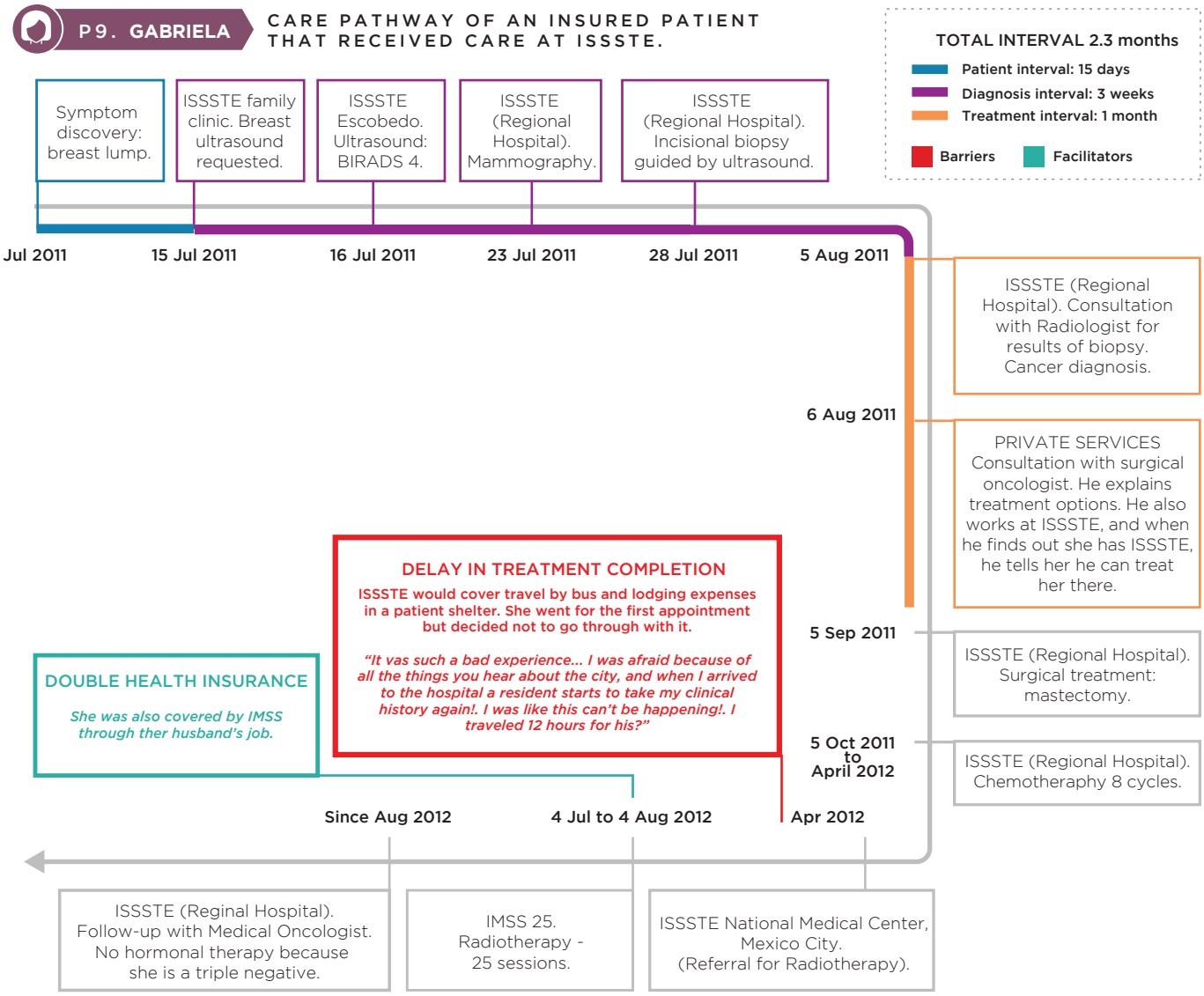




The other problem identified in both IMSS patient narratives has to do with patient-doctor communication. It is notable that both IMSS patients interviewed complained about the doctor begin "rude" or "despotic". The anecdotes they each referred in company of these adjectives actually do support their use of these words. This is worrisome not only because of the emotional harm this can cause to a vulnerable patient, but also because it could act as a barrier for patients to decline treatment or interrupt it.

In the case of Gabriela, treated at ISSSTE, again we see a well-established referral process from first level to second and finally third level services. Here the referral process seems to be quicker than in IMSS, and the hospitals that offer care to patients covered with Seguro Popular.

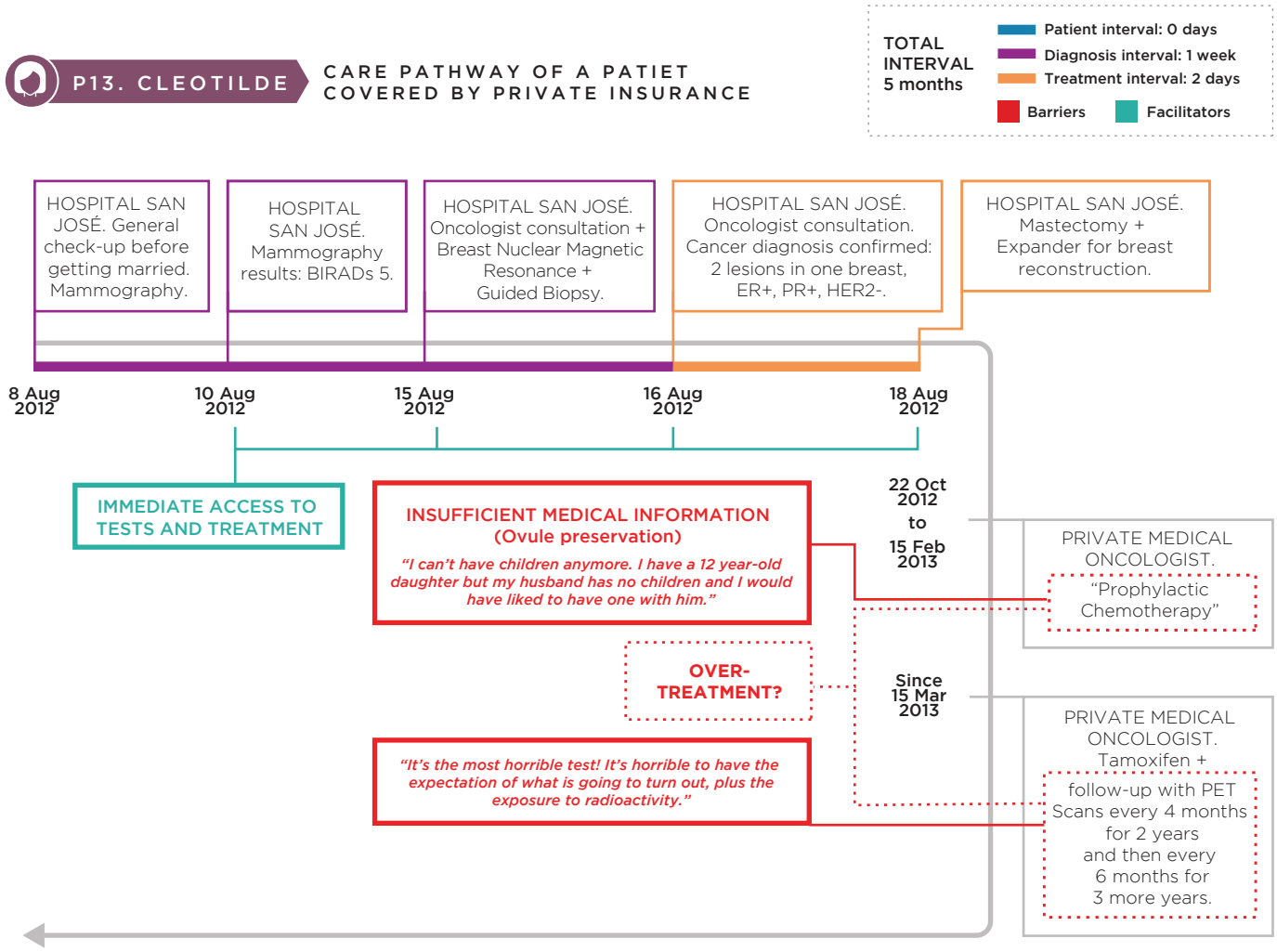
The patient had a confirmed diagnosis within three weeks from the initial consultation in her family clinic and began treatment within a month of that initial contact. The main problem identified in ISSSTE services offered at Monterrey seems to be Radiotherapy services. The ISSSTE doctors interviewed said the institution has the equipment and human resources to offer this treatment, nevertheless they confirmed that the majority of patients are referred to the ISSSTE's National Medical Center (in Mexico City) for radiation therapy. They said it was "institutional policy". This can be a huge barrier to treatment adherence. As it may be seen in Gabriela, she really disliked the experience. She is also an example of the fortunate minority that are insured by two different systems: IMSS and ISSSTE. So, she was able to get radiotherapy in Monterrey at another institution, and without having to pay out-of-pocket.



3 CARE PATHWAYS FOR PATIENTS COVERED BY PRIVATE INSURANCE SCHEMES

Private care for patients that are covered by private health insurance is usually perceived as high quality care with access to the best specialists, the newest technology and treatments. Although this is generally so in the largest hospitals, medical practice is scarcely regulated and each doctor may well do what he pleases in his/her private practice.

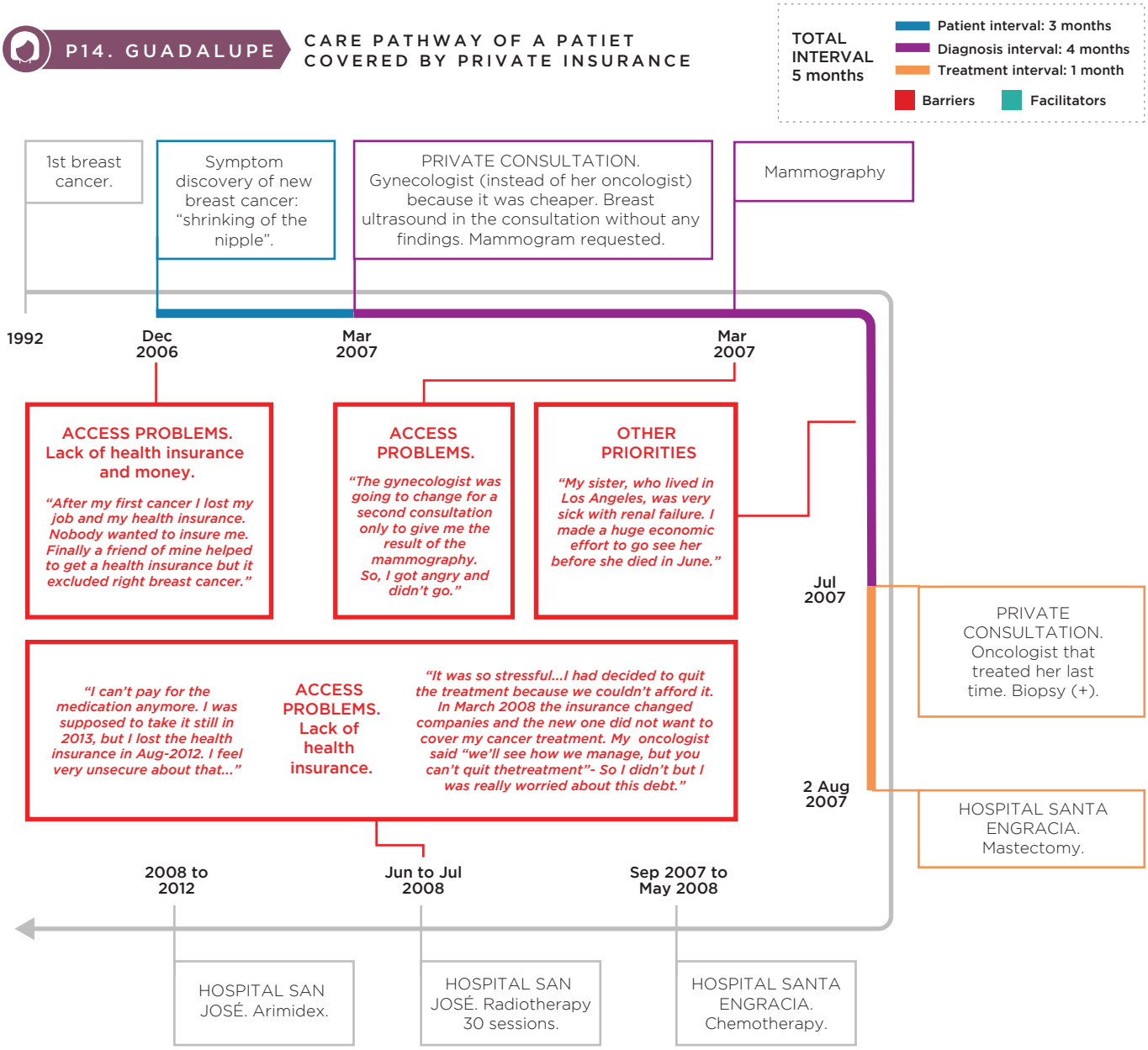
Cleotilde's pathway is an excellent example of the velocity one can be diagnosed and treated in private care when financial resources are not an issue. In this case, she had an unlimited private insurance thanks to the firm she works for. This allowed her diagnosis to be confirmed within a week of an abnormal screening mammogram and to start treatment in less than 10 days after this first mammography was done. That is really a remarkably short time.



Nevertheless there are still issues within her care pathway that are noteworthy because it seems she was over-treated and is under a scheme of over-vigilance. According to the details she gave of her case (and she actually was the best informed patient of all participants) it seems she had a stage I cancer with positive hormonal receptors and negative HER2. It was multifocal though, and therefore the mastectomy is understandable, but the prophylactic chemotherapy not so much. According to international clinical guidelines she might have benefited from receiving only surgery and hormonal therapy. This is worrying because chemotherapy has serious adverse effects. One of them affected importantly her life: the loss of her ovules. What is also noteworthy is that in the frame of this "all available possibilities" care, not only does it seem she was over-treated but also she was not offered the possibility to save ovules.

Finally, in Cleotilde's case it is very worrisome that she is being followed with PET scans every 4 months for 2 years and then every 6 months for three more years. This is outside any clinical guideline, and not only does it affect her emotionally every time that she gets the test, but also she is being exposed to enormous quantities of radiation which may elevate her risk for other cancers. When talking about this to other private oncologists in Monterrey, we were told that it is known that in the clinic where she is getting these PET scans done (Clínica Oca), doctors get a commission for each patient they refer to one of these tests. This is really unethical practice, but again possible when regulation, which by Law falls under the Ministry of Health, is not enforced.

The last example presented is that of a patient that was treated in large and prestigious medical centers. Nevertheless, in this case we see how access can be an issue for patients with private insurance. In the case of Guadalupe (P.14), she had breast cancer twice. The first was 14 years before the second, and she was treated with her private medical insurance back then. After that she lost her job and had a hard time to find a private medical insurance because of her cancer history. She finally got insurance with the help of a friend, which excluded only right sided breast cancer (the one she had first). Nevertheless, when she started with symptoms of her second breast cancer she delayed medical care seeking with her oncologist because she and her husband were both out of jobs and she could not afford to pay a medical consultation with him. Therefore she went to a cheaper doctor, but apparently this doctor reassured her wrongly that everything was alright based on a breast ultrasound he did himself in his office. He did however order a mammogram, but regrettably the results were never known by the patient because she had to pay for a second consultation in order to get them and she refused to do so.

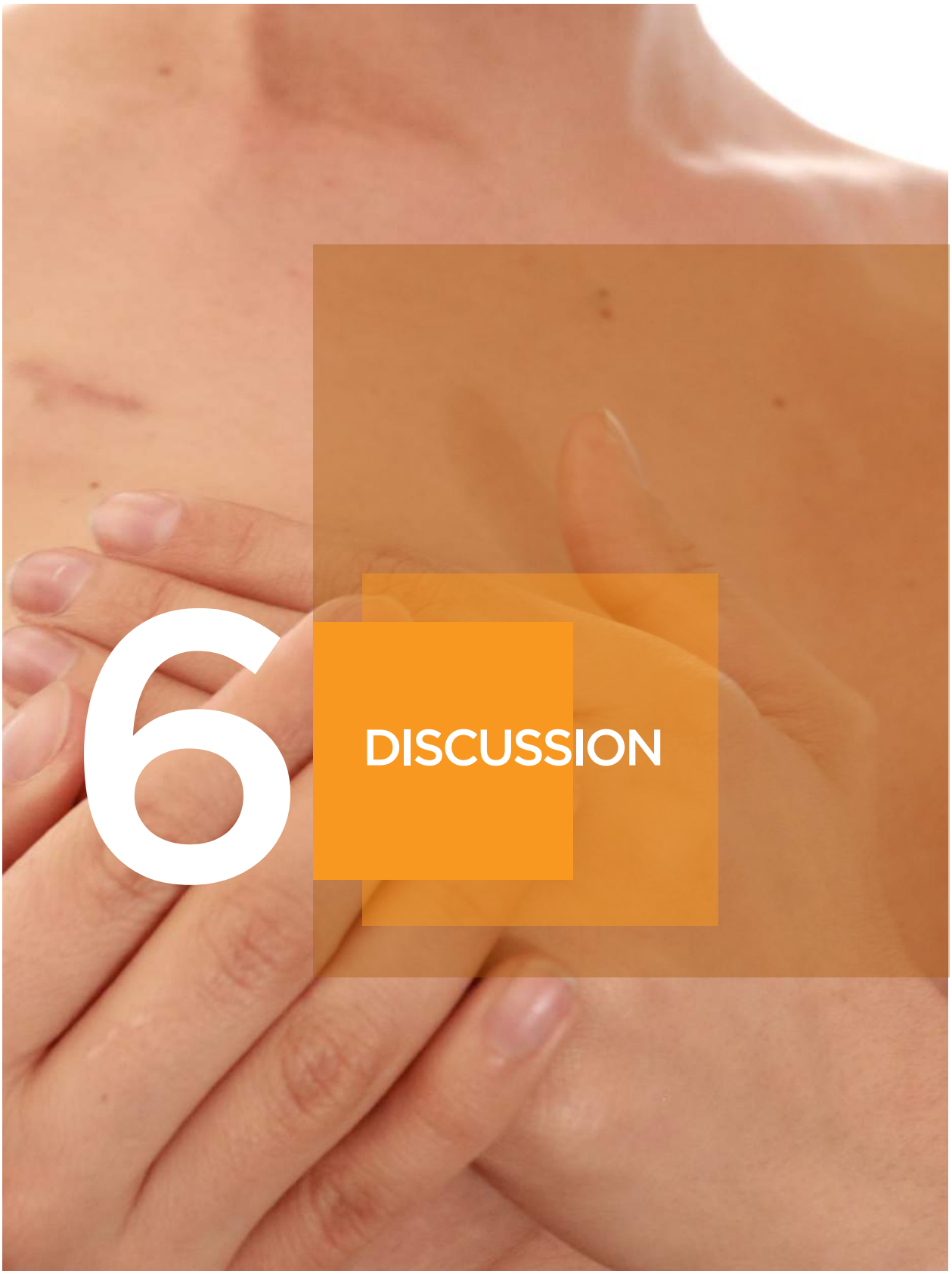


It is quite clear in this case that there were several circumstances in the patient's personal life that contributed to her treatment delay, but financial barriers were an important one. It contributed to her initial postponement of care, then to the continuity of this care, and once in treatment it almost caused her to interrupt it. Furthermore, it was an important source of stress for her throughout her entire care pathway.

Finally the health insurance covered the entire private treatment, but finally she lost her health insurance again and was not able to complete the 5 years of hormone-therapy.

Now she is afraid of what will happen if the cancer comes back. For patients like Guadalupe who are used to receiving this kind of care, other options available for people with lower-resources are not even considered.

To conclude this section, a last point I would like to discuss is another difference between care received at a public institution and that received at a large private hospital. Even though the treatment schemes are, generally, approved by international guidelines in both types of care facilities, it was noteworthy that when the participants talked about their experiences with treatment, patients treated privately had better options in terms of quality of life. For example, neither IMSS nor Seguro Popular cover the catheter for administration of chemotherapy. Patients get the treatment through their peripheral veins. Another example is the surgeries available. It is extraordinary for a patient treated at a public hospital to be treated with a breast-conserving surgery, even more to have a sentinel-node biopsy, and even less common to be offered a reconstructive surgery. In contrast, all these procedures are readily available in large private care services and covered by expensive private insurance schemes.



6 DISCUSSION

susan G. komen

cim*ab

The higher incidence and mortality rates of breast cancer for Nuevo León in comparison to the national average could be due to the higher development of the state's population, in terms of lowest proportions of the population living in high marginalization conditions in comparison to the national average. This could be explained in the same terms that the higher incidence of breast cancer in developed than in developing countries has been understood: as a consequence of an increased exposure to risk factors that are more common in developed regions, like postponement of child bearing, reduced breast-feeding, higher exposure to contraception hormones and hormonal replacement therapy, higher prevalence of obesity, lower levels of physical activity and a diet rich in animal fats and poor in fruits and vegetables.[19, 20]

The data presented in relation to the level of marginalization show that the MMA has low proportions of the population residing in conditions of high and very high marginalization levels. Nevertheless, the MMA has grown faster than the infrastructure necessary to satisfy the needs of this growing urban population. These are the urban poor, who in Latin America are generally reported to be less poor than the rural poor in absolute terms.[22] Nevertheless, they are poor in relation to the majority of the city population and this translates, among other things, into exclusion from health care services.[22] Language barriers, unemployment, underemployment, geographic isolation, low education levels and health illiteracy are factors that explain the exclusion from health care services. For the poorest populations, access to services may be limited by their ability to pay even in the context of free health services where medications have a cost.[23] Moreover, the poor can be further discouraged by difficulties in finding affordable transport, inconvenient hours of clinics' operation, and long waiting times to receive care,[24] as we saw in some of our participants care trajectories.

The health care pathways of the main public health systems available in the Monterrey Metropolitan Area, in combination with the patient trajectories obtained from the qualitative interviews, allow a better understanding of the pathways that breast cancer patients go through from the first symptoms or abnormal screening tests until the end of treatment. Our participant trajectories show that not only the poor, but also people that are better off economically but have somehow been left aside of a health insurance scheme, often face access barriers to affordable and high-quality health care services. The main problems of quality seem to be located in the first and second levels of care, where general doctors, family physicians and gynecologists seem to lack the necessary skills to catch a breast cancer early and to accelerate the patients' access to the required oncologic care. These findings are similar to previous study findings of patients that were treated at the National Cancer Institute in Mexico City. [16, 17]

In general terms, it seems that the care pathways of people covered by a social security scheme are better defined in first, second and third level services and therefore translate in a more organized and agile referral. Nevertheless, in the case of IMSS since second and third level care services are very saturated, it may take some time to get studies and consultation appointments. On the other hand, uninsured patients and those with Seguro Popular, have to seek themselves for health care services where they can access, as the referral routes are not well specified. In their need of immediate care, they sometimes first seek private services, and end up paying important amounts of money. The down sides to this are double. The service they get might not meet the required standards, even though they would expect it to do so since they are paying for it. Also, they might end up with an unethical doctor that of despite the patient's low capacity to pay offers treatment privately instead of referring them to a public institution where they can access care without endangering their patrimony (through the Fund for Protection of Catastrophic Expenses). Finally, patients with private health insurance that allows them to receive the most up-to-date care in the most prestigious private cancer institutions do seem to enjoy more immediate access to diagnosis and treatment, less adverse effects of treatment and better rehabilitation services. Nevertheless they are at risk of being over-treated by doctors who might be seeking to benefit economically from unlimited health insurances that cover everything.

This study describes the breast cancer situation in Monterrey. It provides evidence of strengths and weaknesses of the MMA public health system in terms of epidemiological panorama of breast cancer, preparedness to offer the required medical services to an increasing BC patient population and experiences of patients in contact with these services. There seems to be much work still needed to improve access to cancer services in Monterrey to bring down the advanced stages at diagnosed and therefore improve mortality rates. Probably a good place to start would be in the strengthening of medical competence to adequately diagnose breast cancer in a timely fashion in the first and second level services (general practitioners, family physicians and gynecologists) and establish well delineated referral guidelines from first level care services so that the third level care services are reached as promptly as possible.

S STUDY LIMITATIONS

Qualitative data is always very relevant to understand patient experiences and identify the different factors that explain the phenomena under study. Nevertheless, this type of methodology does not allow generalizability nor the study of causality.

To complement this study and measure how common the access and quality problems here identified are, a quantitative study would be needed.

S STUDY IMPLICATIONS

The study reveals several areas of opportunity for improvement of access and quality of breast cancer care services in the Monterrey Metropolitan Area. Several worrisome examples were shown of medical errors and problems of communication with patients. Even though it is responsibility of the Ministry of Health to work on improving these issues, in practice it is not being able to monitor quality of care of health services nor to demand further training of medical doctors in practice. Non-governmental and academic institutions could aid on these matters through funding and provision of extra-curricular courses directed to strengthen key health personnel's knowledge and technical competence for adequate breast care. The most important levels of care that need to be improved in order to shorten times to treatment and therefore allow downstaging of the disease are the first and second levels of care.

The first level of care in public services dependent of the Ministry of Health is essentially performed by medical doctors who have recently finished their university studies. General practitioners also commonly open small consultation offices where they offer private care with more affordable prices for the poor. They have a small amount of knowledge for a vast amount of diseases, and in the typical curricula of Medical School, little attention is given to cancer (if any at all). In services dependent of IMSS and ISSSTE, first level of care is taken care of by primary care physicians. They have a specialty of family practice, but still their background knowledge on cancer is minimal.

The second level of care is mainly covered by gynecologists and less commonly by general surgeons. By formation, a gynecologist's curricular preparation is focused on obstetric care and in care of the female reproductive organs. They have little formal training on breast cancer, even though they are often the first contact of care for any breast problem.

Both these professionals, general doctors and gynecologists, could largely benefit from extra-curricular courses on breast cancer (as well as other chronic diseases that are currently the main public health problems in the country). These courses should be very practical on terms of: how to suspect that a patient might have breast cancer (symptoms) and specific algorithms of what tests should be requested and what are the institutions that she should be referred for in order to get attention as soon as possible. This wouldn't be a hard thing to do, doctors could receive this information in a single day, and this could change their practice.

Of course, the quality of the information and the way that it is taught would be the key issues here. Sometimes oncologists are very well-intentioned in better informing general practitioners and gynecologists, but fail to do so in useful manner because they want to explain so many things in so much detail. The other key issue is that they can be given specific information of where to send patients for a mammogram, for an ultrasound, for a biopsy, and for treatment. For personnel of IMSS or ISSSTE, this is straightforward, very well established. But for private practice physicians and those working for a health center of the Ministry of Health, specific algorithms should be developed and made available to them so that they know where the closest mammography unit is, for example.

On the other hand, these first level personnel are sometimes requesting the right tests but are getting false negative results. This reflects the quality issues that we have been observing with the taking and interpretation of mammography and breast ultrasounds around the country as they have become popular and attractive for business. The quality could be vastly improved if:

1. there were more medical physicists available and integrated in mammography units to continually evaluate the quality of the process of taking the studies,
2. technicians were better trained in the right positioning of the patients and quality evaluation of the studies they take, and
3. radiologists receive better training in breast imagenology so that they really have the necessary tools to interpret adequately.

These measures require a long-term view and deep commitment of health care institutions and private care facilities.

Another interesting area of opportunity would be to work on the improvement of personal skills of health care personnel. This has shown to have a direct impact on patient satisfaction and treatment adherence. Maybe courses for better communication with patients could be offered for the oncologic institutions (especially IMSS, as there appears to be a problem with the breast surgeon in the way he communicates with patients).

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