

Demographic characteristics of patients with breast cancer

Key observations

- The median age at registration of patients with breast cancer in Morocco was about 50 years, which is comparable to median ages reported in several Asian and African countries but 5–10 years younger than those observed in Europe and North America. This can be explained by the shape of the underlying population pyramid, which is skewed towards younger age groups.
- At both oncology centres in Morocco, most of the women with breast cancer were premenopausal, essentially reflecting the younger age distribution. An increase in the proportion of premenopausal breast cancers was seen at INO in 2015–2017 compared with 2008–2010 and 2011–2014. However, missing information bias regarding menopausal status in the 2015–2017 period should be borne in mind because, when considering the age distribution, the proportion of women aged 50 years and younger remained stable during the three time periods.
- The other demographic variables explored in the study (age at diagnosis, place of residence, marital status, parity, and family history of breast cancer) were similarly distributed in both centres, and no significant trends within the time period of the study were observed.
- There is less representation of the rural populations at the city-based oncology centres. This issue needs to be studied further to determine whether it is because rural populations have access to other oncology centres or because they are unable to travel to the city or there are other issues.
- In our study, most of the patients undergoing treatment at the two oncology centres were covered by some form of medical insurance, and a significant improvement in the levels of coverage was documented over the years. This is an important finding because the United Nations 2030 Agenda for Sustainable Development identified UHC as an essential component in efforts to reduce health inequalities.

3.1. Demographic characteristics of the patients in the study

Certain demographic and social characteristics may influence the

stage at diagnosis, tumour characteristics, and compliance with diagnostic and treatment recommendations, which ultimately may affect survival after treatment. Many of these characteristics change over

time. We have grouped the patients registered at CM-VI and INO by their year of registration (2008–2010, 2011–2014, and 2015–2017) to study the sociodemographic characteristics. The demographic characteristics

of the patients registered at CM-VI and INO (grouped by period of registration and study site) are shown in Table 3.1.

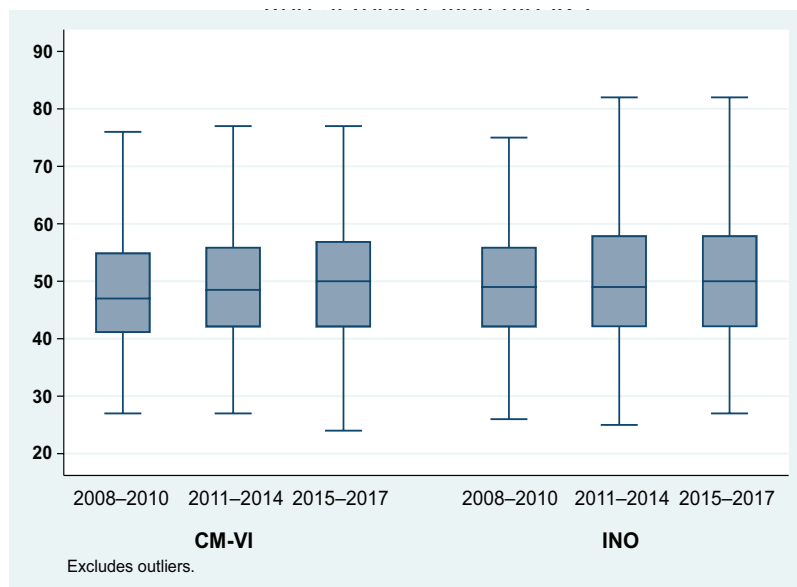
3.1.1 Age at registration

The age information was collected from the patients' records as documented at the time of registration. The median age of patients at registration was 49 years (interquartile range [IQR], 42–57 years) at both centres (Fig. 3.1). In our study, 18.9% of patients with breast cancer at CM-VI and 17.4% of patients at INO were younger than 40 years at the time of registration. No significant change in age distribution was observed over time at either CM-VI ($P = 0.76$) or INO ($P = 0.68$).

Mean age at diagnosis of breast cancer was reported earlier for the population-based cancer registries (PBCRs) at Casablanca (49.5 years) and Rabat (50.0 years) in 2012 (Slaoui et al., 2014). These mean ages are similar to those in our study. A prospective study of 716 patients with breast cancer registered at INO in 2009 reported a mean age of 49 years; more than a quarter of these patients (25.7%) were aged 40 years or younger (Slaoui et al., 2016).

As found in Morocco, several LMICs have reported the median age at diagnosis of patients with breast cancer to be about 50 years, which is 5–10 years younger than the median ages observed in Europe and North America (Adeloye et al., 2018). In a systematic review of 83 studies involving nearly 25 000 patients with breast cancer in sub-Saharan Africa, 77% of the studies reported mean age at diagnosis to be less than 50 years (Jedy-Agba et al., 2016). The lower median age for breast cancer detection in Africa and many LMICs outside the continent has been attributed to the shape of

Fig. 3.1. Box plot of age (years) at registration by period and centre of registration. CM-VI, Centre Mohammed VI pour le traitement des cancers; INO, Institut National d'Oncologie Sidi Mohamed Ben Abdellah.



the underlying population pyramids, which are skewed towards younger age groups. The median age at breast cancer onset is proportional to the median age of the underlying population at risk, independent of the geographical location. Using data

from all incident breast cancers reported globally during 1983–2012, it has been demonstrated that incidence rates in African or Asian women aged 20–44 years are similar to those in women in North America or Europe in the same age range

Fig. 3.2. Population pyramid of Morocco in 2020 showing proportionately large numbers of women aged 40 years or younger. Source: United Nations (2019). © 2019 United Nations. Reprinted with the permission of the United Nations.

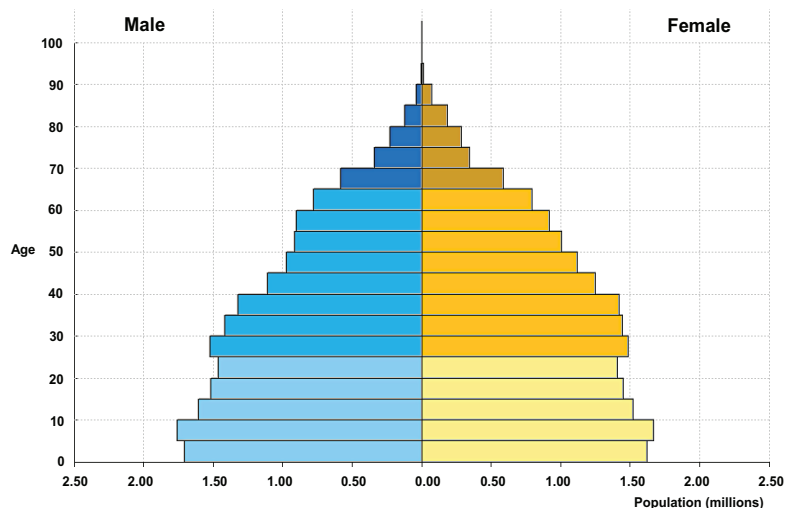


Table 3.1. Patient characteristics by centre and period of registration

Characteristics	CM-VI				INO			
	2008–2010		2011–2014		2015–2017		Total	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
No. of patients assessed	214	360	341	915	313	413	479	1205
Age at diagnosis (years)								
< 30	4 (1.9)	7 (1.9)	12 (3.5)	23 (2.5)	6 (1.9)	8 (1.9)	6 (1.3)	20 (1.7)
30–34	14 (6.6)	22 (6.1)	21 (6.2)	57 (6.2)	20 (6.4)	21 (5.1)	20 (4.2)	61 (5.1)
35–39	26 (12.2)	35 (9.7)	31 (9.1)	92 (10.1)	31 (9.9)	41 (10.0)	54 (11.3)	126 (10.5)
40–44	39 (18.3)	63 (17.5)	50 (14.7)	152 (16.6)	49 (15.7)	78 (19.0)	80 (16.8)	207 (17.2)
45–49	37 (17.4)	62 (17.2)	56 (16.4)	155 (17.0)	61 (19.5)	74 (18.0)	74 (15.5)	209 (17.4)
50–54	34 (16.0)	64 (17.8)	56 (16.4)	154 (16.8)	53 (16.9)	57 (13.9)	79 (16.6)	189 (15.7)
55–59	19 (8.9)	40 (11.1)	46 (13.5)	105 (11.5)	43 (13.7)	44 (10.7)	67 (14.0)	154 (12.8)
60–64	13 (6.1)	33 (9.2)	33 (9.7)	79 (8.6)	21 (6.7)	39 (9.5)	47 (9.9)	107 (8.9)
65–69	11 (5.2)	13 (3.6)	20 (5.9)	44 (4.8)	15 (4.8)	19 (4.6)	24 (5.0)	58 (4.8)
≥ 70	16 (7.5)	21 (5.8)	16 (4.7)	53 (5.8)	14 (4.5)	30 (7.3)	26 (5.5)	70 (5.8)
Total	213 (100.0)	360 (100.0)	341 (100.0)	914 (100.0)	313 (100.0)	411 (100.0)	477 (100.0)	1201 (100.0)
Missing	1 (0.5)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)	2 (0.5)	2 (0.4)	4 (0.3)
Residence								
Urban	164 (76.6)	258 (71.7)	250 (73.3)	672 (73.4)	276 (88.2)	307 (74.3)	432 (90.2)	1015 (84.2)
Semi-urban	28 (13.1)	57 (15.8)	29 (8.5)	114 (12.5)	18 (5.8)	30 (7.3)	20 (4.2)	68 (5.6)
Rural	22 (10.3)	45 (12.5)	62 (18.2)	129 (14.1)	19 (6.1)	76 (18.4)	27 (5.6)	122 (10.1)
Total	214 (100.0)	360 (100.0)	341 (100.0)	915 (100.0)	313 (100.0)	413 (100.0)	479 (100.0)	1205 (100.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 3.1. Patient characteristics by centre and period of registration (continued)

Characteristics	CM-VI						INO		
	Period of registration			Total	Period of registration			Total	
	2008–2010	2011–2014	2015–2017	n (%)	2008–2010	2011–2014	2015–2017	n (%)	
Social security coverage									
None	149 (82.8)	137 (41.8)	4 (1.3)	290 (35.3)	165 (82.5)	65 (16.9)	57 (12.1)	287 (27.2)	
RAMED	2 (1.1)	174 (53.0)	268 (85.6)	444 (54.1)	0 (0.0)	263 (68.5)	295 (62.8)	558 (52.9)	
CNOPS	7 (3.9)	4 (1.2)	16 (5.1)	27 (3.3)	24 (12.0)	40 (10.4)	66 (14.0)	130 (12.3)	
CNSS	22 (12.2)	13 (4.0)	25 (8.0)	60 (7.3)	11 (5.5)	16 (4.2)	52 (11.1)	79 (7.5)	
Total	180 (100.0)	328 (100.0)	313 (100.0)	821 (100.0)	200 (100.0)	384 (100.0)	470 (100.0)	1054 (100.0)	
Missing	34 (15.9)	32 (8.9)	28 (8.2)	94 (10.3)	113 (36.1)	29 (7.0)	9 (1.9)	151 (12.5)	
Profession									
Housewife	161 (89.4)	270 (96.1)	224 (96.1)	655 (94.4)	214 (98.2)	357 (96.5)	396 (90.8)	967 (94.4)	
Others	19 (10.6)	11 (3.9)	9 (3.9)	39 (5.6)	4 (1.8)	13 (3.5)	40 (9.2)	57 (5.6)	
Total	180 (100.0)	281 (100.0)	233 (100.0)	694 (100.0)	218 (100.0)	370 (100.0)	436 (100.0)	1024 (100.0)	
Missing	34 (15.9)	79 (21.9)	108 (31.7)	221 (24.2)	95 (30.4)	43 (10.4)	43 (9.0)	181 (15.0)	
Education level									
None	52 (86.7)	88 (90.7)	203 (97.1)	343 (93.7)	26 (92.9)	32 (80.0)	27 (61.4)	85 (75.9)	
Some	8 (13.3)	9 (9.3)	6 (2.9)	23 (6.3)	2 (7.1)	8 (20.0)	17 (38.6)	27 (24.1)	
Total	60 (100.0)	97 (100.0)	209 (100.0)	366 (100.0)	28 (100.0)	40 (100.0)	44 (100.0)	112 (100.0)	
Missing	154 (72.0)	263 (73.1)	132 (38.7)	549 (60.0)	285 (91.1)	373 (90.3)	435 (90.8)	1093 (90.7)	
Marital status									
Single	30 (14.6)	62 (18.8)	52 (16.8)	144 (17.1)	37 (12.9)	61 (15.1)	69 (15.5)	167 (14.7)	
Married	126 (61.5)	200 (60.6)	193 (62.5)	519 (61.5)	218 (76.2)	261 (64.4)	335 (75.3)	814 (71.7)	
Widowed	36 (17.6)	39 (11.8)	31 (10.0)	106 (12.6)	22 (7.7)	56 (13.8)	24 (5.4)	102 (9.0)	
Separated	13 (6.3)	29 (8.8)	33 (10.7)	75 (8.9)	9 (3.1)	27 (6.7)	17 (3.8)	53 (4.7)	
Total	205 (100.0)	330 (100.0)	309 (100.0)	844 (100.0)	286 (100.0)	405 (100.0)	445 (100.0)	1136 (100.0)	
Missing	9 (4.2)	30 (8.3)	32 (9.4)	71 (7.8)	27 (8.6)	8 (1.9)	34 (7.1)	69 (5.7)	

Table 3.1. Patient characteristics by centre and period of registration (continued)

Characteristics	CM-VI						INO		
	Period of registration			Total	Period of registration			Total	
	2008-2010	2011-2014	2015-2017		2008-2010	2011-2014	2015-2017		
n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Parity									
0	58 (28.9)	69 (22.3)	65 (21.7)	192 (23.7)	61 (20.5)	92 (24.1)	94 (23.6)	247 (22.9)	
1 or 2	53 (26.4)	88 (28.5)	78 (26.0)	219 (27.0)	75 (25.3)	99 (25.9)	106 (26.6)	280 (26.0)	
3 or 4	45 (22.4)	93 (30.1)	93 (31.0)	231 (28.5)	82 (27.6)	91 (23.8)	117 (29.3)	290 (26.9)	
≥ 5	45 (22.4)	59 (19.1)	64 (21.3)	168 (20.7)	79 (26.6)	100 (26.2)	82 (20.6)	261 (24.2)	
Total	201 (100.0)	309 (100.0)	300 (100.0)	810 (100.0)	297 (100.0)	382 (100.0)	399 (100.0)	1078 (100.0)	
Missing	13 (6.1)	51 (14.2)	41 (12.0)	105 (11.5)	16 (5.1)	31 (7.5)	80 (16.7)	127 (10.5)	
Menopausal status									
Premenopausal	112 (57.4)	191 (57.7)	158 (56.0)	461 (57.1)	146 (47.2)	195 (47.8)	241 (61.3)	582 (52.4)	
Postmenopausal	83 (42.6)	140 (42.3)	124 (44.0)	347 (42.9)	163 (52.8)	213 (52.2)	152 (38.7)	528 (47.6)	
Total	195 (100.0)	331 (100.0)	282 (100.0)	808 (100.0)	309 (100.0)	408 (100.0)	393 (100.0)	1110 (100.0)	
Missing	19 (8.9)	29 (8.1)	59 (17.3)	107 (11.7)	4 (1.3)	5 (1.2)	86 (18.0)	95 (7.9)	
Oral contraception									
No	130 (64.4)	301 (87.5)	203 (86.0)	634 (81.1)	220 (72.1)	242 (70.8)	126 (66.7)	588 (70.3)	
Yes	72 (35.6)	43 (12.5)	33 (14.0)	148 (18.9)	85 (27.9)	100 (29.2)	63 (33.3)	248 (29.7)	
Total	202 (100.0)	344 (100.0)	236 (100.0)	782 (100.0)	305 (100.0)	342 (100.0)	189 (100.0)	836 (100.0)	
Missing	12 (5.6)	16 (4.4)	105 (30.8)	133 (14.5)	8 (2.6)	71 (17.2)	290 (60.5)	369 (30.6)	
Family history of breast cancer in first- and second-degree relatives									
No	175 (90.2)	282 (85.5)	239 (88.2)	696 (87.5)	265 (86.9)	343 (87.1)	350 (88.2)	958 (87.4)	
Yes	19 (9.8)	48 (14.5)	32 (11.8)	99 (12.5)	40 (13.1)	51 (12.9)	47 (11.8)	138 (12.6)	
Total	194 (100.0)	330 (100.0)	271 (100.0)	795 (100.0)	305 (100.0)	394 (100.0)	397 (100.0)	1096 (100.0)	
Missing	20 (9.3)	30 (8.3)	70 (20.5)	120 (13.1)	8 (2.6)	19 (4.6)	82 (17.1)	109 (9.0)	
Diagnosed before registration at oncology centre	84 (39.3)	190 (52.8)	156 (45.7)	430 (47.0)	163 (52.1)	294 (71.2)	323 (67.4)	780 (64.7)	

CM-VI, Centre Mohammed VI pour le traitement des cancers; CNOFOS, Caisse Nationale des Organismes de Prévoyance Sociale; CNSS, Caisse Nationale de Sécurité Sociale; INO, Institut National d'Oncologie Sidi Mohamed Ben Abdellah; RAMED, Régime d'Assistance Médicale.

(Bidoli et al., 2019). Morocco has a relatively young population. In 2018, the median age of Moroccans was just 29 years and only 4.7% of the total population was aged 70 years and older (World Population Review, 2020). Given these figures, it is unsurprising that proportionately higher numbers of women are diagnosed with breast cancer at younger age (Fig. 3.2).

3.1.2 Place of residence

Most patients registered at the oncology centres lived in urban or semi-urban areas; only 14.1% of those registered at CM-VI and 10.1% of those registered at INO resided in rural areas. No consistent trend was observed in the rural–urban divide of the patients attending the oncology centres over 10 years. At CM-VI the proportion of women from rural areas increased steadily over time, from 10.3% in 2008–2010 to 18.2% in 2015–2017. At INO the proportion of rural patients was higher in 2011–2014 (18.4%) than in 2008–2010 (6.1%) or 2015–2017 (5.6%).

Although Morocco had an annual urban population growth of approximately 2% in the past decade (Central Intelligence Agency, 2020; World Bank, 2020), in 2020 36.5% of the population still lived in rural areas. It is possible that most rural patients with cancer visited the regional oncology centres in their region and did not need to travel to the urban centres. This issue should be further investigated to ensure that rural patients with breast cancer are indeed accessing the services of the regional oncology centres and are receiving the same standard of care as that offered at CM-VI or INO. A recent analysis identified considerable gaps in access to high-quality health care between urban and rural areas, between public and private hospitals, and between various regions

in Morocco (Jacob, 2020). An estimated 45% of doctors in Morocco practise in either Rabat or Casablanca, whereas the number of doctors working in the rural parts of the country accounts for just 24% of the total.

3.1.3 Marital status

Only 17.1% of the patients with breast cancer at CM-VI and 14.7% of those at INO were single at the time of diagnosis. The others were married, widowed, or separated. No significant difference was observed either between the centres or over the years.

3.1.4 Parity

At CM-VI, 23.7% of patients with breast cancer were nulliparous and 27.0% had given birth to 1 or 2 children. Data obtained from INO showed similar results (nulliparous: 22.9% and having 1 or 2 children: 26.0%). The proportion of nulliparous women among patients with breast cancer was comparable to that reported in other hospital-based studies in Morocco (Tazzite et al., 2013). Nulliparous women are at a higher risk of developing breast cancer, and each birth has been found to confer an average 7% long-term reduction in the relative risk of breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer, 2002). A recent case–control study from Fes University in Morocco reported a significant 4-fold increased risk of breast cancer in nulliparous women compared with parous women (Khalis et al., 2018).

3.1.5 Menopausal status

At both oncology centres, most of the women with breast cancer were premenopausal (57.1% at CM-VI and 52.4% at INO), essentially reflecting the younger age distribution. Al-

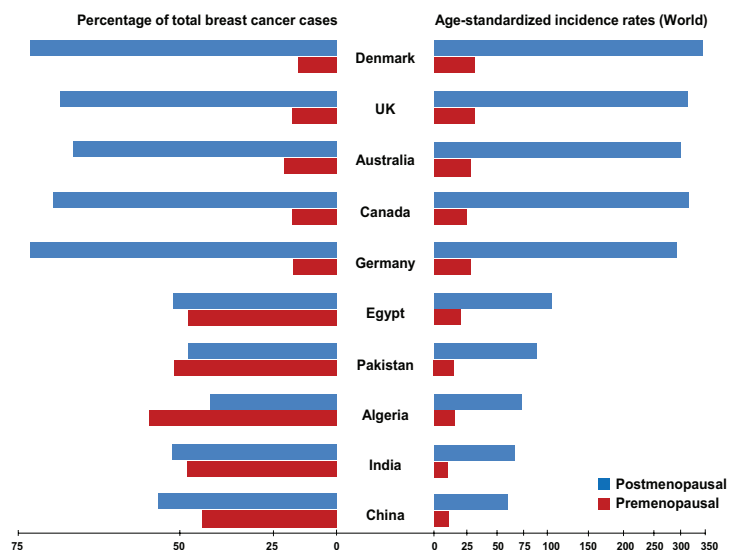
though no significant change in the proportion of premenopausal breast cancers was observed over time at CM-VI ($P = 0.91$), a significant increase in the proportion was seen at INO in 2015–2017 compared with other periods (47.2% in 2008–2010, 47.8% in 2011–2014, and 61.3% in 2015–2017; $P < 0.001$). However, this increased percentage observed in 2015–2017 at INO should be balanced against the high percentage of missing information regarding menopausal status in 2015–2017 (18.0%). Indeed, when considering the age distribution, the proportion of women aged 50 years and younger remained stable at about 50% during the three time periods.

Analysing the data from different PBCRs, Ghiasvand et al. demonstrated that even though premenopausal breast cancers comprised a substantially higher proportion of all incident breast cancers in developing countries compared with developed countries, the age-standardized incidence rate of premenopausal breast cancer was consistently higher in the developed countries (Fig. 3.3) (Ghiasvand et al., 2014). Their results showed that the dramatic increase in breast cancer incidence in all countries (irrespective of level of development) was mainly due to the rise in the number of cases in postmenopausal women. There is no valid reason to be concerned about the finding that women in Morocco have an earlier onset of breast cancer.

3.1.6 Family history of breast cancer

A family history of breast cancer in first- and/or second-degree relatives was reported by 12.5% of patients at CM-VI and 12.6% at INO, and no change was observed over time. Our data are consistent with the results of a longitudinal study from INO that reported a family history of breast

Fig. 3.3. Estimated proportions and age-standardized incidence rates of premenopausal and postmenopausal breast cancer (on a log scale) in selected countries in 2008. Source: Ferlay J, Shin H-RR, Bray F, Forman D, Mathers C, and Parkin DM (2010). GLOBOCAN 2008, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/>.



cancer in 14.5% of the patients (Slaoui et al., 2016).

A large case–control study involving more than 5000 African American patients with breast cancer reported that a family history of breast cancer in first-degree relatives significantly increased the risk of ER-positive cancer (odds ratio [OR], 1.76; 95% CI, 1.57–1.97), ER-negative cancer (OR, 1.67; 95% CI, 1.42–1.95), and triple-negative cancer (OR, 1.72; 95% CI, 1.38–2.13) (Bethea et al., 2016). An earlier retrospective study in patients with breast cancer registered at CM-VI observed that patients with a family history (one or more relatives with breast cancer within three generations) were younger, had worse histopathological grade, and had higher rates of lymph node metastasis compared with the women without a family history (Tazzite et al., 2013). We did not observe any difference in age distribution, stage, pathology, or mo-

lecular characteristics of breast cancers detected between women with a family history and those without.

3.2 Financing of cancer treatment

Both CM-VI and INO are publicly funded oncology centres, and the cost of treatment is subsidized by the government. There is no registration charge and admission is free for all. Radical surgery can cost about US\$ 500, and the total cost of EBRT is approximately US\$ 1500. In our study, most of the patients undergoing treatment at the oncology centres were covered by some form of insurance scheme.

3.2.1 Health insurance schemes in Morocco

All residents in Morocco are legally entitled to free public primary health-care services. Patients need to pay

for the services delivered by public secondary and tertiary hospitals, unless they are covered by a health insurance scheme.

Health financing reforms to establish UHC through nonsubsidized and subsidized social health insurance (SHI) schemes were launched in Morocco in 2002. Assurance maladie obligatoire (AMO) is a non-subsidized obligatory medical insurance scheme launched in 2005 to cover professionals (both in-service and retired) in the public and private sectors. The scheme is implemented through two managing bodies: Caisse Nationale des Organismes de Prévoyance Sociale (CNOPS) for civil servants and public sector workers and Caisse Nationale de Sécurité Sociale (CNSS) for workers in the private sector. The beneficiaries of AMO have to pay 30% of the hospital charges unless they have a complementary health insurance. AMO was extended to cover post-secondary students in September 2015. A second nonsubsidized SHI scheme called INAYA was launched in 2007 for self-employed individuals, but it was not very successful in attracting the target populations.

A subsidized insurance scheme (Régime d'Assistance Médicale [RAMED]), financed by the state and local communities, provides basic medical coverage for the most economically disadvantaged populations. Under RAMED, beneficiaries have to make either no or a small contribution towards their medical expenses, depending on income categories. The scheme was piloted in 2010 in the Tadra-Azilal region and scaled up nationally in 2012.

Some sectors of the population are covered by private health insurance schemes, and there is a separate health insurance scheme for those employed in the armed forces. Patients covered by private health insurance pay out-of-pocket when they

use public health facilities, and are later reimbursed by their insurance provider.

A World Bank study showed that 19% of the population (6.35 million people) were covered by the RAMED scheme in November 2016 and more than half of the population of Morocco was covered by either a subsidized or a nonsubsidized social health insurance scheme (Fig. 3.4) (Chen, 2018).

3.2.2 Medical insurance coverage for the patients at CM-VI and INO

The levels of medical insurance coverage for patients with breast cancer by year of registration and study site are shown in Fig. 3.5. Overall, 64.5% of patients registered at CM-VI and 72.8% of patients registered at INO were covered by a health insurance scheme. An improvement in the SHI coverage was documented over the years at both CM-VI and INO. A total of 82.8% of patients registered at CM-VI in 2008–2010 did not have any insurance. The proportion decreased dramatically to only 1.3% in 2015–2017, when 85.6% were covered by the RAMED scheme. Similarly, a total of 82.5% of patients registered at INO in 2008–2010 did not have any insurance. The proportion decreased to only 12.1% in 2015–2017, when 62.8% were covered by the RAMED scheme.

3.2.3 Addressing social inequities in health care and moving towards UHC

UHC means that all people have access to the health services they need, including preventive, curative, rehabilitative, or palliative services of adequate quality without being exposed to financial hardship (Kieny et al., 2017). The United Nations 2030 Agenda for Sustainable Develop-

Fig. 3.4. Proportions of the Moroccan population covered by different health insurance schemes in 2016.

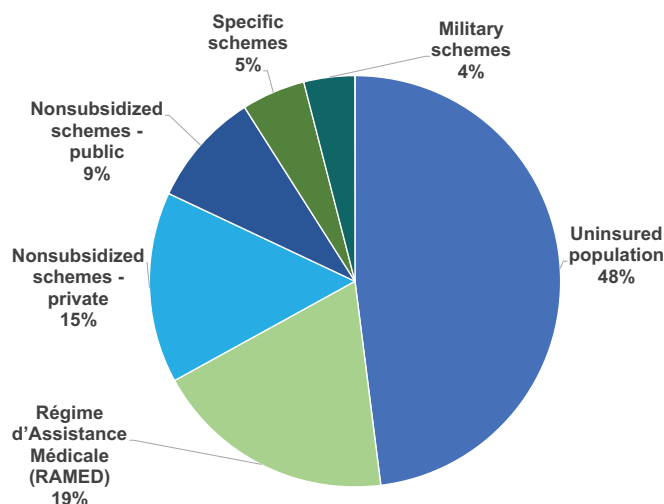
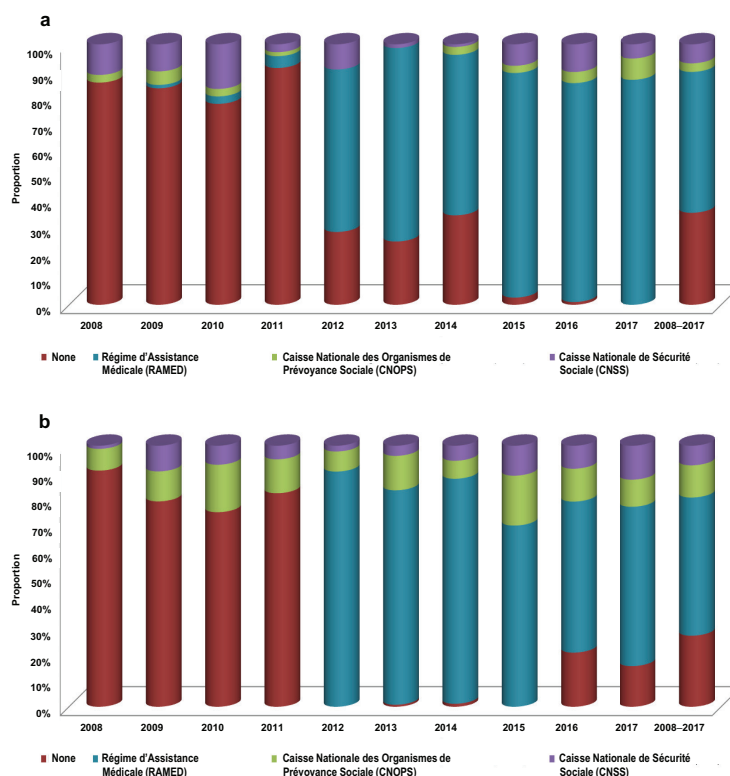


Fig. 3.5. Social security coverage of patients with breast cancer by period of registration (a) at the Centre Mohammed VI pour le traitement des cancers (CM-VI), Casablanca and (b) at the Institut National d'Oncologie Sidi Mohamed Ben Abdellah (INO), Rabat.



ment (Goal 3: Ensure healthy lives and promote well-being for all at all ages) identified achievement of UHC

as one of the essential components to reduce health inequalities (United Nations, 2015).

Cancer care in LMICs needs to be covered by the principles of UHC with publicly financed, high-quality services being offered across the cancer care continuum, from diagnosis to palliative care and survivorship. The prolonged, complex, and multimodal treatment needed for cancer leads to catastrophic expenditure that often pushes families into poverty unless they are protected by some form of financing. Studies have reported that in LMICs more than 30% of the annual expenditures for inpatient cancer treatment are met from borrowing and/or asset sales and even then, many patients

eventually abandon treatment (Mahal et al., 2013).

In its health-care planning, Morocco has followed the strategy of progressive universalism, which starts by introducing policies for identifying and protecting the poorest and most vulnerable (Gwatkin and Ergo, 2011). The costs of the health insurance scheme for workers and government employees are covered by payroll deductions, supplemented by contributions from the employers. Those in the informal sectors pay a small contribution, and the extremely poor are exempted from any contributions.

Similar schemes were introduced in Ghana, although there were issues with long-term sustainability without any donor contributions (Knaul et al., 2015). Our study shows that health insurance schemes are at least covering the costs of inpatient care for patients with breast cancer in Morocco and have done so successfully for nearly a decade. Free breast cancer screening and diagnosis services, combined with financial protection for cancer treatment, are likely to have a significant impact on breast cancer outcomes in Morocco in the long term.

References

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