Ambulatory care sensitive conditions in Portugal

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Abstract

The aim of this study is to identify which elements of primary health care (PHC) need strengthening to avoid unnecessary hospitalizations of ambulatory care sensitive conditions (ACSCs) in Portugal. ACSCs are health conditions for which hospitalization or emergency care can be avoided through addressing these conditions effectively in PHC. How the strengthening of PHC can be achieved is captured in a set of actionable policy recommendations. This publication is part of the multicountry study on ACSCs in the WHO European Region

Keywords

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Abbreviations

ACES	groups of primary care centres [agrupamentos de centros de saúde]
ACSC	ambulatory care sensitive condition
ACSS	Central Administration of the Health System [Administração Central do Sistema de Saúde]
ARS	regional health administrations [administrações regionais de saúde]
CCUs	community care units [unidades de cuidados na comunidade]
COPD	chronic obstructive pulmonary disease
GP	general practitioner
ICP	integrated care pathway [processo assistêncial integrado]
IT	information technology
LHU	local health unit
NCDs	noncommunicable diseases
NHS	National Health Service [Serviço Nacional de Saúde]
P4P	pay for performance
PCP	primary care physician
PHC	primary health care
SPMS	Shared Services of the Ministry of Health [Serviços Partilhados do Ministério da Saúde]
UCSPs	personalized health care units [unidades de cuidados de saúde personalizados]
URAPs	units of shared care resources [unidades de recursos assistênciais partilhados]
USFs	family health units [unidades de saúde familiares]

Executive summary

The aim of this study is to identify which elements of primary health care (PHC) need strengthening to avoid unnecessary hospitalizations of ambulatory care sensitive conditions (ACSCs) in Portugal. ACSCs are health conditions for which hospitalization or emergency care can be avoided through addressing these conditions effectively in PHC. How the strengthening of PHC can be achieved is captured in a set of actionable policy recommendations. This assessment is part of the multicountry study on ACSCs in the WHO European Region.

The study involved an extensive literature review focusing on the current health care setting in Portugal in relation to ACSC management. Data on ACSC hospitalization rates were then collected and analysed. Two stakeholder workshops with health professionals and health policy experts were held, and participants identified the most relevant ACSCs for Portugal and estimated the proportion of avoidable hospitalizations. Subsequently, a prioritization model was constructed to identify additional priority ACSCs for Portugal. Outputs of the prioritization model were further validated at the stakeholder consultation, resulting in selection of three ACSCs with the highest relevance in Portugal: chronic obstructive pulmonary disease (COPD), heart failure and hypertensive heart disease. Barriers to and opportunities for their effective prevention, diagnostics and treatment in PHC were also identified and discussed during stakeholder consultations.

In 2013, 123 231 (or 12.3%) of the 1 003 602 hospitalizations registered in mainland Portugal were attributable to ACSCs. Of these, 29 419 were due to pneumonia, 17 734 to COPD, 17 535 to heart failure, 17 448 to hypertensive heart disease and 15 222 to kidney and urinary tract infections. Analysis of data on regional variation has shown that when disaggregated at municipality level, hospitalization rates for heart failure were higher in the most northern and interior regions of Portugal, and in central Portugal. Low hospitalization rates seemed to cluster closer to the coast and around larger cities. Regional variation in hypertensive heart disease has shown higher hospitalization rates in interior regions of the country. Medical experts assessed that on average, 57% of heart failure hospitalizations, 61% of COPD hospitalizations and 66% of hospitalizations for hypertensive heart disease were preventable with timely PHC interventions. This means that approximately 32 500 hospitalizations were preventable in 2013.

Further analysis on delivery of services for selected ACSCs has shown that there is a chronic shortage of general practitioners (GPs) in Portugal. The availability of the existing GPs has reduced, once cost constrains faced during last years had implications in the number of PHC that provide services after-hours. The reduced availability of after-hours can explain that 40.8% of all emergency departments' visits are not urgent cases and patients could have accessed care in different settings. Also contributing to this factor is the traditional hospital-centricity of the Portuguese National Health Service, which despite the gatekeeping role of PHC is maintained both through misaligned financial incentives and population perceptions of greater quality of care at the hospitals. Interoperability of e-health platforms among levels of care represents another challenge for ensuring the continuity of care for patients with chronic conditions. The three identified priority ACSCs in Portugal share a common nature, its chronicity, and therefore the approach to strengthen PHC should be mixed and integrated.

The experts' recommendations were clustered around five areas. First, service availability gaps for effective prevention of ACSCs should be addressed by expanding and aligning the

PHC service package to population needs, for example, through making smoking cessation services for COPD patients available in PHC. Second, the coordinating role of PHC should be reinforced through introduction of GP-led disease management programmes or obligatory post-hospitalization follow-ups. Third, uptake of integrated clinical pathways and models of care should be accelerated to address the lack of integration between levels of care. Fourth, the high prevalence of ACSC hospitalizations among elderly patients should be tackled though expanding the long-term care services to patients in nursing homes. Last, routine monitoring of ACSC performance indicators can be used to identify quality and coordination gaps in local health units, as well as serve as a basis for introducing and aligning provider incentives.

1. Introduction

This study discusses findings and presents policy recommendations on health conditions that could be effectively prevented, diagnosed and treated in PHC settings in Portugal. The study focuses on three ACSCs – heart failure, hypertensive heart disease and COPD – that can serve as tracers to identify opportunities for and challenges to strengthening PHC in mainland Portugal[1].

The publication is part of the multicountry study on ACSCs in the WHO European Region. Other countries included in the initiative are: Germany, Kazakhstan, Latvia and the Republic of Moldova. The study's purpose is to contribute to strengthening PHC by identifying opportunities and challenges to effectively preventing, diagnosing and treating ACSCs, and deriving contextualized and actionable policy recommendations for health services delivery transformation. A summary of the analytical framework for the study is presented in Annex 1.

Despite the decreasing trend, Portugal still has a high burden of premature mortality. In 2014, 22% of deaths occurred before 70 years of age; this figure was 27% in 2004. Over 70% of premature deaths are due to cancer (41%), cardiovascular diseases (16%), external causes of injury and poisoning (9%) and digestive disorders (6%) *(1)*. The probability of dying between ages 30 and 70 years from the four

main noncommunicable diseases (NCDs) was 12% in 2012 *(1)*. NCDs are responsible for 86% of total deaths. The main causes of death are cardiovascular diseases (32%), cancer (28%), chronic respiratory diseases (6%), diabetes (5%) and other NCDs (15%) *(1)*. Many of these chronic conditions are sensitive to ambulatory care, i.e. could be avoided with a well-functioning network of PHC facilities that provide appropriate and timely prevention, diagnosis, management and treatment.

Avoiding unnecessary hospitalizations is an important indicator of quality of ambulatory care and efficiency of the health system. In 2013, 123 231 (or 12.3%) of the 1 003 602 hospitalizations registered in mainland Portugal were attributable to ACSCs. Of these, 29 419 were due to pneumonia, 17 734 to COPD, 17 535 to heart failure, 17 448 to hypertensive heart disease and 15 222 to kidney and urinary tract infections. These disease groups are considered highly preventable as shown in other similar studies *(2–3)*.

This report is structured with a section on methodology (Section 2), results of data analysis and stakeholder consultation that led to the selection of the ACSCs (Section 3), elements of health services delivery that require strengthening to successfully address selected ACSCs (Section 4) and policy recommendations to move towards effectively addressing the selected ACSCs in PHC in Portugal (Section 5).

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[1]   Refers to continental territory of Portugal.

2. Methods

In the context of the analytical framework of the study (Annex 1), the main steps consisted of desk research, analysis of hospitalization admission data and a stakeholder consultation (through surveys and workshops). These steps are further described below.

2.1 Health services desk research

A structured search strategy was developed to retrieve the most recent information that related to ACSCs in Portugal. The most recent academic literature was gathered from index databases (PubMed, Medline) and grey literature was collected using search terms based on elements of the analytical framework. Reviewed documents included policies and regulations, mission reports, assessment and studies conducted at national and regional levels, and other publicly available documents and reviews. The literature search was mainly restricted to documents published in English and Portuguese.

2.2 Hospitalization admission data

According to the analytical framework, hospitalization admission data from 2002 to 2013 were used for the list of ACSCs defined by Caminal et al. *(4)*. The Central Administration of the Health System [Administração Central De Sistemas De Saúde (ACSS)] of Portugal provided data for mainland Portugal. The National Statistics Institute provided population estimates. Data were disaggregated by regions (districts) and quinquennial age categories. The hospitalization rates allowed identification of ACSCs accounting for the highest numbers of hospitalizations and their regional variations (see subsection 3.2).

2.3 Selection of ACSCs: data analysis and stakeholder consultation

Data analysis was further complemented with provider and expert survey results. First, a provider survey asked primary care physicians (PCPs)[2] to identify six priority ACSCs, as well as their perception of how preventable each ACSC was (Annexes 2–3). This information was disseminated through informal (access-restricted) professional networks. In total, 48 PCPs (31 GPs, 16 residents and an undifferentiated PCPs) filled in the survey. A prioritization model based on several quantitative measures (weighted by experts) was used to analyse the survey results.

Second, two stakeholder workshops were held in Lisbon (September 2015) to identify priority ACSCs in Portugal. Health professionals attended the first, which was focussed on identifying priority ACSCs and discussing treatment pathways, availability of resources for selected ACSCs and identification of opportunities for and challenges to strengthening PHC. The second one, attended by health system and health policy experts along with health professionals, focussed on analysing possible policy recommendations. Participants, organized in four groups, reflected on existing barriers and opportunities for reducing the number of avoidable hospitalizations for ACSCs. The groups were asked to complete a questionnaire (Annex 4). Based on the outcomes of the data analysis and stakeholder workshops, three priority ACSCs were selected and analysed (Annexes 5–6), and actionable policy recommendations were formulated. The lists of participants who attended the workshops are in Annexes 7–8.

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[2] PCPs are GPs, public health doctors and specialists that work in primary care *(5)*.

2.4 Limitations of the study

The first limitation of this study is related to the identification of the specific list of ACSCs for Portugal. Several internationally recognized lists of ACSCs exist; each has been validated in specific contexts, but none in the Portuguese health care system. Use of a standardized list of ACSCs might have resulted in the omission of some ACSCs relevant to Portugal. Second, the methods used are not exhaustive in capturing all factors that influence the number of ACSC hospitalizations, for example, prevalence of the selected ACSC are not fully known, providers characteristics are not detailed in depth (i.e. PHC coverage, distance to hospital) and populations' socioeconomic status could not be determined. These characteristics might represent confounding factors in the ACSC hospitalization trends and regional differences. Furthermore, the use of an administrative database (used for financing purposes) may introduce bias or registration differences as differences in hospital admission rates might actually represent differences in registration practices. Last, focus of this study is only on mainland Portugal and does not include data from its autonomous regions situated on archipelagos of Madeira and Azores.

3. Building the case for focusing on ACSCs

In 2013, 123 231 (or 12.3%) of the 1 003 602 hospitalizations registered in mainland Portugal were attributable to ACSCs. The overall national rate of hospitalizations for ACSCs was 1238.8 hospitalizations per 100 000 population (Table 1). The majority of hospitalizations occurred following a visit to the emergency department (93.7%) with no significant gender differences; females comprised 50.3% of cases. The most frequent cause of hospitalization was pneumonia (23.9%), followed by COPD, heart failure, hypertensive heart disease and urinary tract infections. These top five causes are responsible for 79% of all hospitalizations.

Table 1. Overview of most common ACSCs in mainland Portugal and number of hospitalizations, 2013

ACSC	Number of hospitalizations	Percentage of total	Cumulative %	Hospitalization rate per 100 000 population
Pneumonia	29 419	23.9	23.9	295.7
COPD	17 734	14.4	38.3	178.3
Heart failure	17 535	14.2	52.5	176.3
Hypertensive heart disease	17 448	14.2	66.7	175.4
Urinary tract infections	15 222	12.4	79.1	153.0
Diabetes	4828	3.9	83	48.5
Convulsions	4175	3.4	86.4	42.0
Skin diseases	3229	2.6	89	32.5
Asthma	2652	2.2	91.2	26.7
Hydro-electrolytic disorders	2342	1.9	93.1	23.5
Gastroenteritis	2279	1.8	94.9	22.9
Upper respiratory tract infections	1898	1.5	96.4	19.1
Bleeding/perforated ulcers	1623	1.3	97.7	16.3
Iron deficiency anaemia	1466	1.2	98.9	14.7
Tuberculosis	769	0.6	99.5	7.7
Pelvic inflammatory disease	452	0.4	99.9	4.5
Appendicitis with complications	136	0.1	100	1.37
Infectious diseases	18	<0.1	100	0.18
Congenital syphilis	6	<0.1	100	0.06
Total	**123 231**	**100**	**100**	**1238.8**

Analysis of the age-distribution of hospitalizations showed two peaks (Fig. 1). The first occurs in children under 5 years, caused mostly by pneumonia and urinary tract infections. The second occurs in the elderly (70 years and older) mainly caused by pneumonia, COPD, heart failure, hypertensive heart disease and urinary tract infections (Fig. 2).

Fig. 1. ACSC hospitalizations by age group and gender, 2013
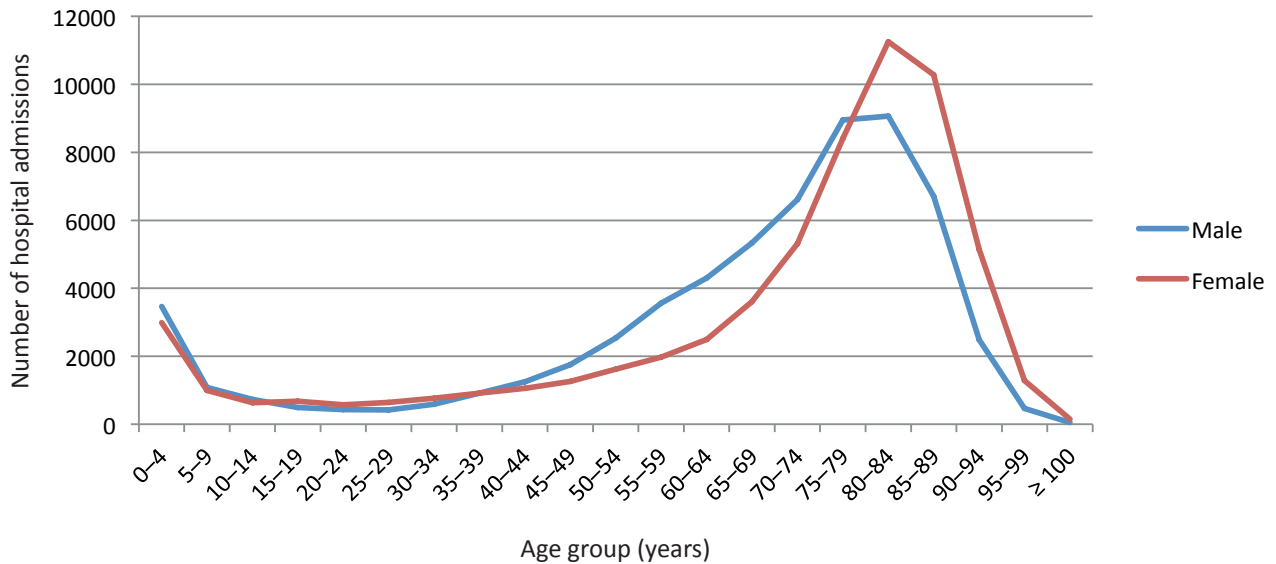
Fig. 2. Top 5 ACSC hospitalizations by age group, 2013
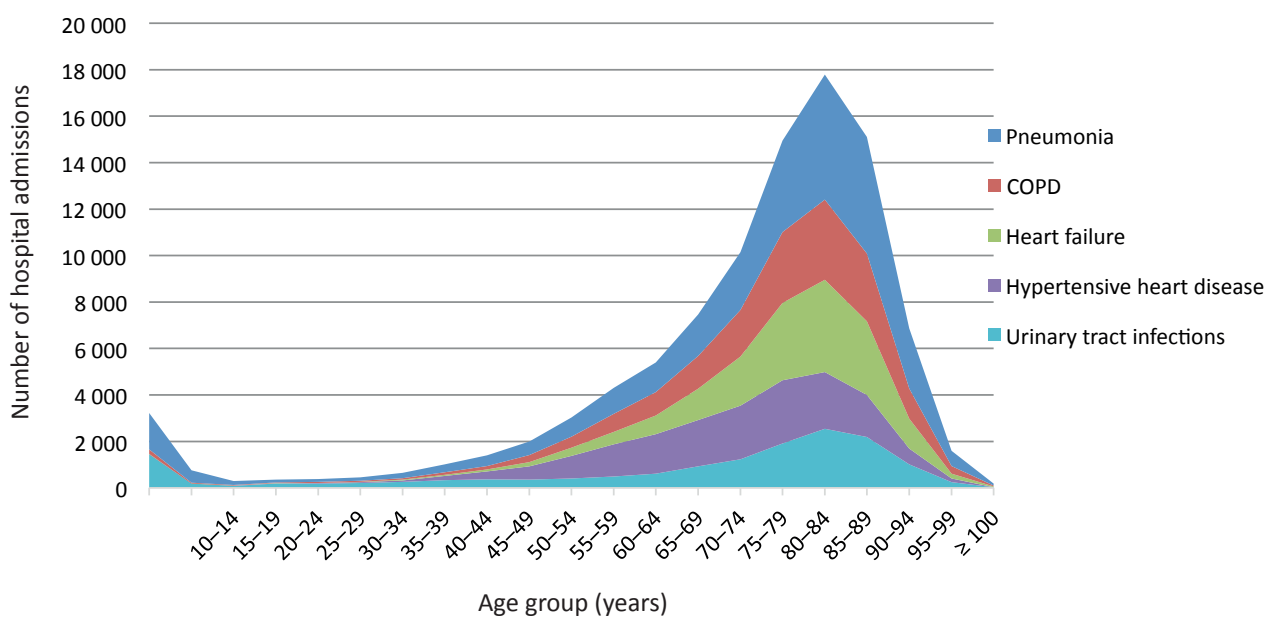
The number of hospitalizations for ACSCs has increased from 112 657 in 2002 to 123 231 in 2013 (Fig. 3). Chronic conditions accounted for a higher number of hospitalizations than acute conditions in 2013 (Fig. 3).

Fig. 3. Total number of chronic and acute ACSC hospitalizations in mainland Portugal, 2002–2013
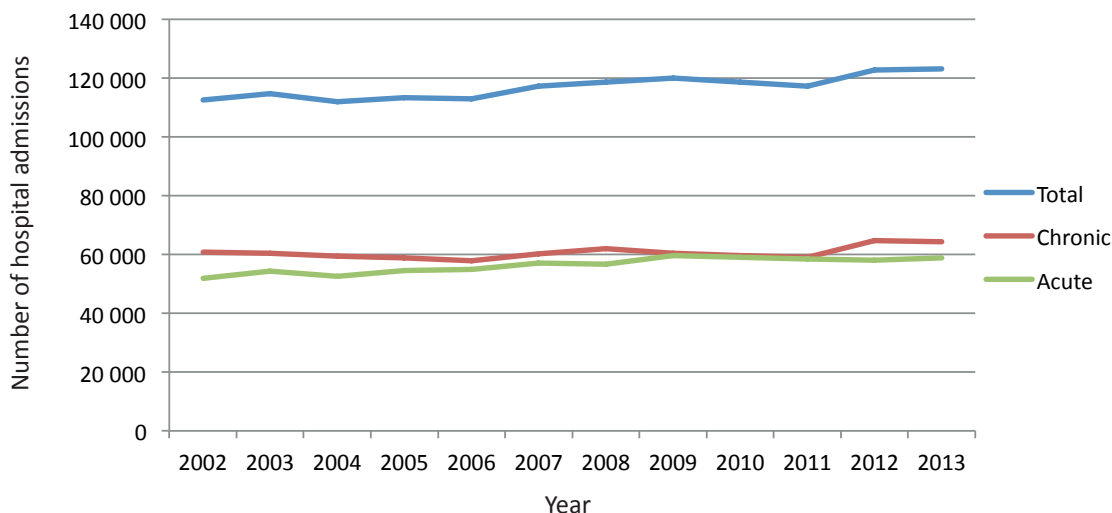
A time-trend analysis for ACSCs has shown that over the last decade, the number of hospitalizations attributable to pneumonia, COPD, heart failure and urinary tract infections have incrased, while hospitalizations for hypertensive heart disease and diabetes have decreased (Fig. 4). Over the last decade, the total number of hospitalizations for ACSCs has risen although the standardized rate of hospitalizations has fallen (see Annex 6), which serves as an indirect indicator of the impact of the ageing population and growing prevalence of chronic conditions. A closer look into the underlying causes of these trends has the potential to give insight into improving services delivery.

Fig. 4. Top causes of ACSC hospitalizations in mainland Portugal, 2002–2013
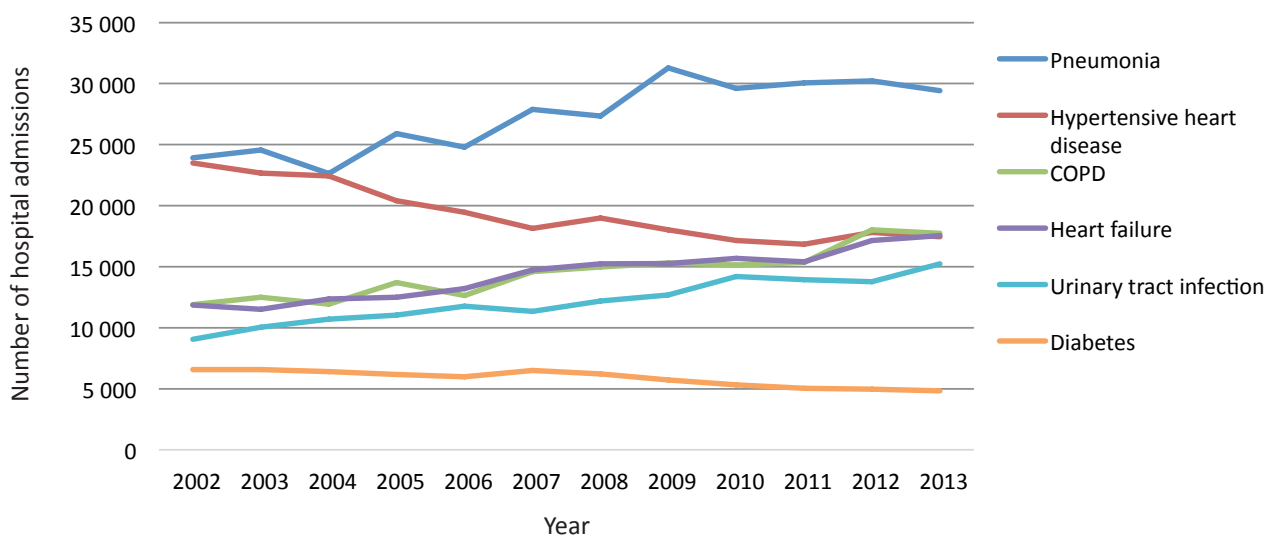
3.1 Selected priority ACSCs

PCPs who attended the first stakeholder consultation prioritized ACSCs in Portugal as COPD, diabetes, heart failure, asthma, hypertensive heart disease and pneumonia (Fig. 5). The ACSC most frequently selected as the first priority was diabetes. PCPs were also asked to rate the degree to which hospitalizations for ACSCs could be prevented by effective PHC interventions (Annex 3). The results were included in the prioritization model explained further on.

Fig. 5. Priority ACSCS chosen by surveyed PCPs
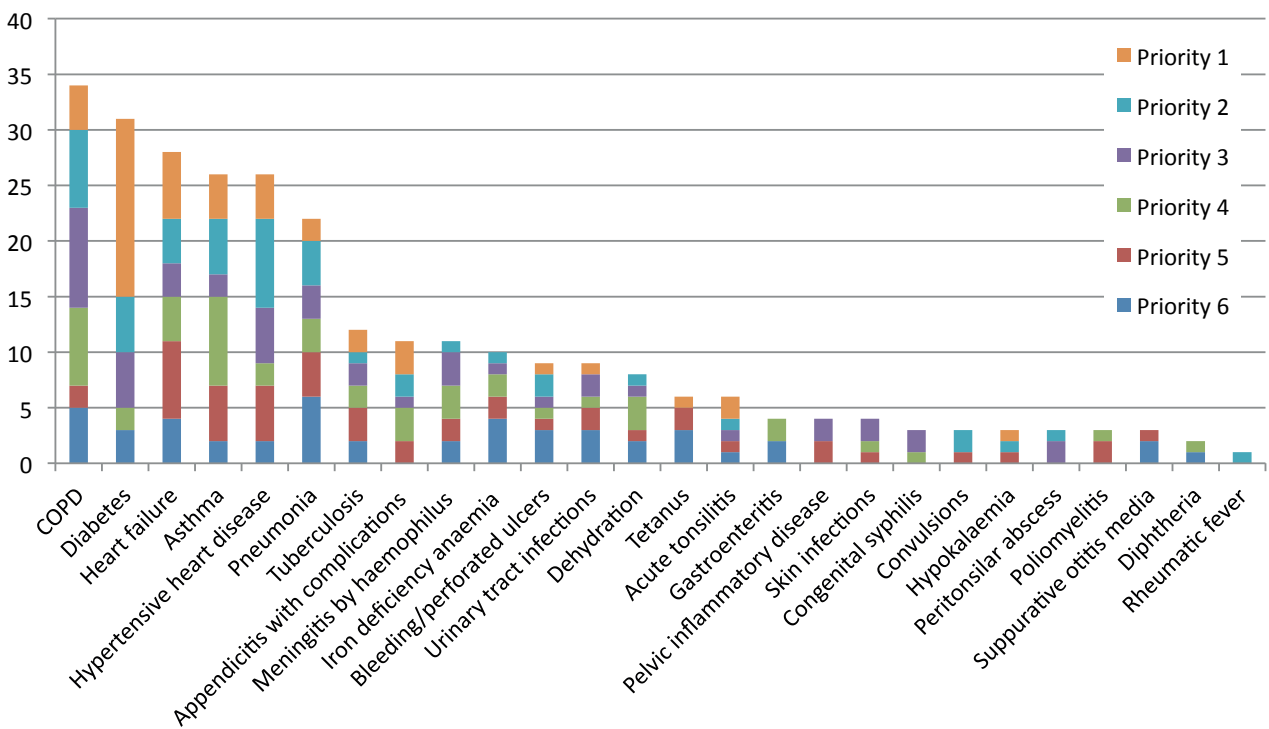
Without disclosing the results of the PCP survey, a group of experts were asked to take the same survey. The results of this prioritization method were similar to that of the PCP survey (Fig. 6), although the ACSC most frequently selected as the first priority in this survey was heart failure.

Fig. 6. Priority ACSCs chosen by expert panel
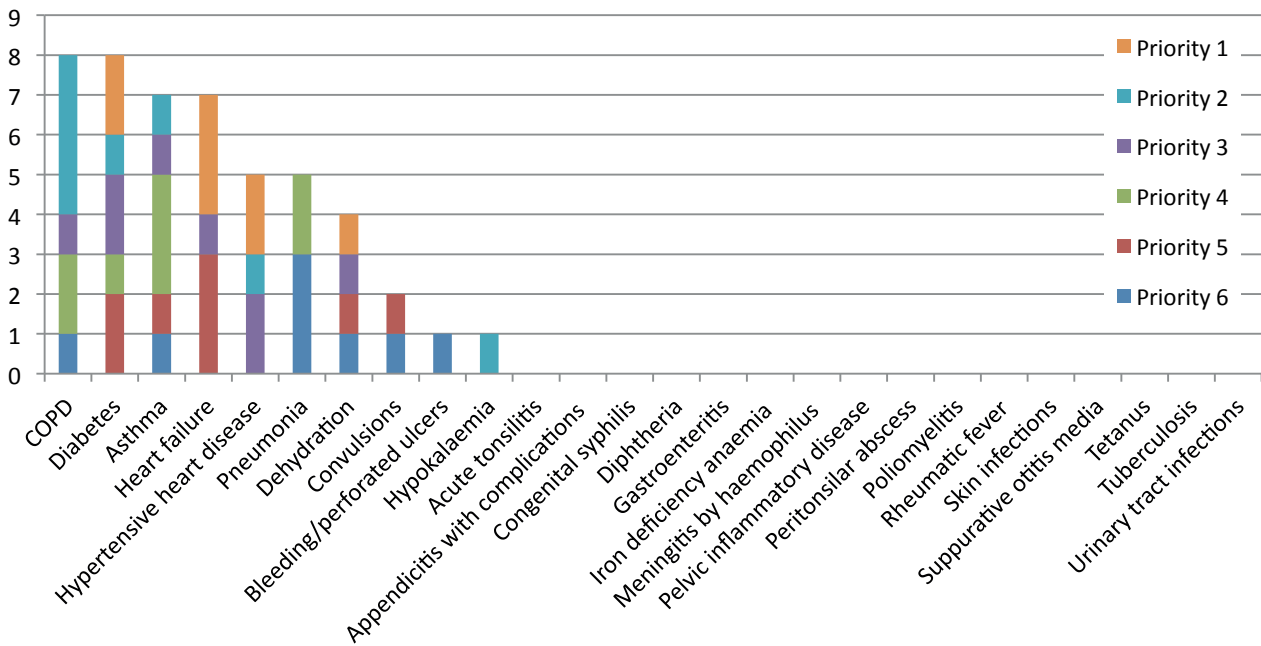
As a final step in selecting the three ACSCs for analysis, a prioritization model based on the quantitative data available was constructed. The variables, its rationale, operationalization and results are in Annex 5. In the process of data consolidation, infectious diseases and congenital syphilis were excluded from the model due to the low number of cases. The consolidated prioritization model identified a list of priority ACSCs – diabetes, hypertensive heart disease, COPD, heart failure and pneumonia – and omitted asthma and urinary tract infections (Fig. 7).

Fig. 7. Results of the different priority identification methodologies
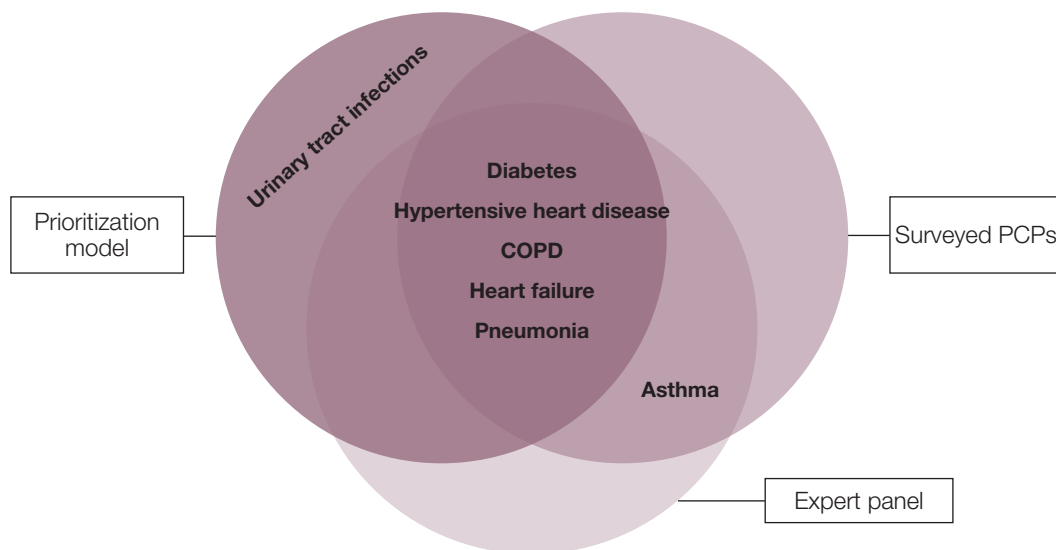
To conclude the selection, experts were informed of the results of the identification methodologies (without knowing which method yielded which result to avoid contamination of the following selection stage) and a discussion took place. As a result of the extensive selection process, heart failure, hypertensive heart disease and COPD were included in the scope of the study.

3.2 Regional variation of hospitalizations for ACSCs

To better understand the geographic distribution of the hospitalizations for ACSCs, age-standardized hospitalization rates were calculated for each municipality as defined by the Directorate-General for the Territorial Development of Portugal. The standardized rate of hospitalizations in municipalities ranged from 335.6 to 2059.3 per 100 000 population, and the mean was 733.5 per 100 000 population with a standard deviation of 217.7 hospitalizations. Calculated ACSC hospitalization rates for each municipality were then distributed into five equidistant percentiles and were used to produce a map of regional variations (Fig. 8). Despite the absence of a clear geographical pattern, ACSC rates were higher in districts such as Vila Real, Bragança, Castelo Branco, Coimbra and Portalegre; lower rates were observed in the districts of Braga, Porto, Guarda, Beja and Faro.

Fig. 8. Regional variations in age-standardized hospitalization rates for ACSCs per 100 000 population, mainland Portugal, 2013

Standardized hospitalization rates for ACSCs per 100 000 population

- <613
- 613–692
- 693–788
- 789–925
- ≥926
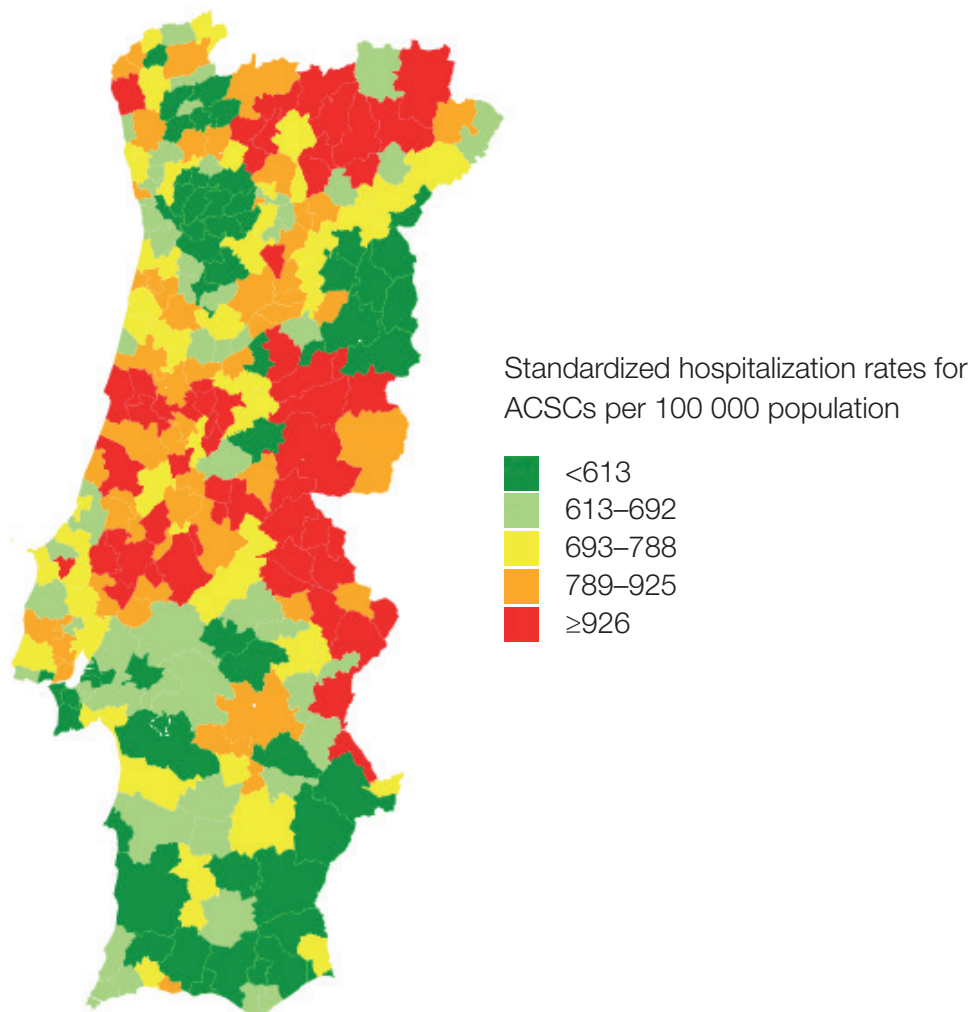
3.2.1 Heart failure

Heart failure caused 17 535 hospitalizations (14.2% of all hospitalizations for ACSCs) in 2013. Most hospitalizations for heart failure (88.2%) occurred in patients aged 65 years and over, and women were more frequently hospitalized (55.4%).

The mean standard rate of hospitalizations for heart failure was 245.7 per 100 000 population. The variation between the highest and lowest rates was almost nine-fold between municipalities, with 77 hospitalizations per 100 000 population in Vila Nova de Famalicão (Braga district) and 678 per 100 000 in Pedrógão Grande (Leiria district). The concentration of higher hospitalization rates for heart failure in northern and inner Portugal (Fig. 9) can be explained by the older populations in these regions, as well as documented inequities in access to health services *(5)*.

Surveyed PCPs have indicated that approximately 57% of all hospitalizations for heart failure could be prevented by more effective provision of services. This number is similar to an estimate of a similar study conducted in Germany, where 64% of hospitalizations for heart failure were estimated as preventable *(6)*.

Fig. 9. Regional variations in age-standardized hospitalization rates for heart failure per 100 000 population, mainland Portugal, 2013

Standardized hospitalization rates for heart failure per 100 000 population

- <158
- 158–197
- 198–247
- 248–314
- ≥315
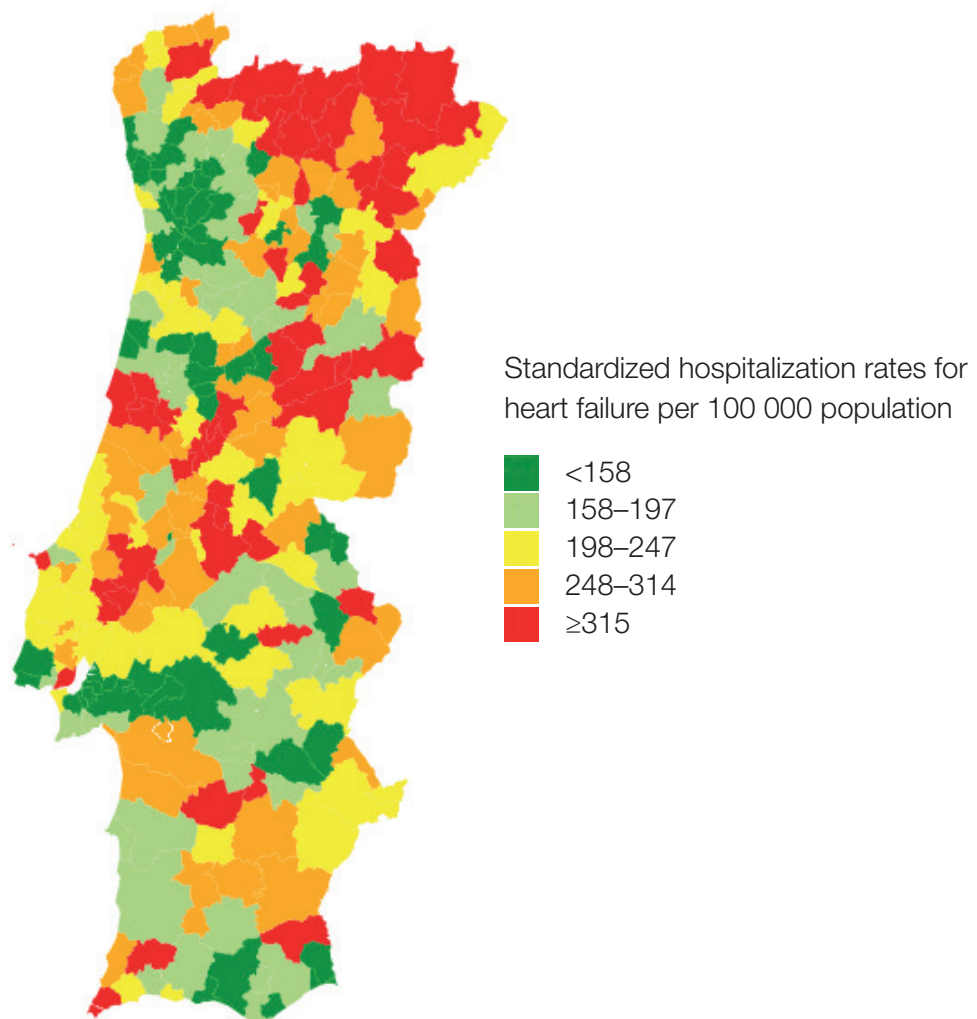
3.2.2 Hypertensive heart disease

Hypertensive heart disease caused 17 448 hospitalizations (14.2% of all hospitalizations for ACSCs) in 2013. The regional variation for hypertension was seven-fold, ranging from 155 to 1126 per 100 000 population, with the lowest rate in Vizela (Braga district) and the highest in Alter do Chão (Portalegre district). The average was 242.7 hospitalizations per 100 000. Men were more frequently hospitalized (57.9%), and the majority of hospitalizations (87.2%) occurred in the population aged 55 years and older. The regional distribution shows a significant difference between the coastal and inner regions of Portugal, especially the Alentejo region (Fig. 10).

Surveyed PCPs have indicated that approximately 66% of all hospitalizations for hypertensive heart disease could have been avoided by more effective provision of services in ambulatory settings, which is lower than findings of other similar studies. In Germany, estimates showed that 83% of all hospital admissions for hypertension could have been avoided; this figure is 75% in Kazakhstan and 60–70% in the Republic of Moldova *(6–8)*.

Fig. 10. Regional variations in age-standardized hospitalization rates for hypertensive heart disease per 100 000 population, mainland Portugal, 2013

Standardized hospitalization rates for hypertensive heart disease per 100 000 population

- <278
- 278–332
- 333–394
- 395–464
- ≥465
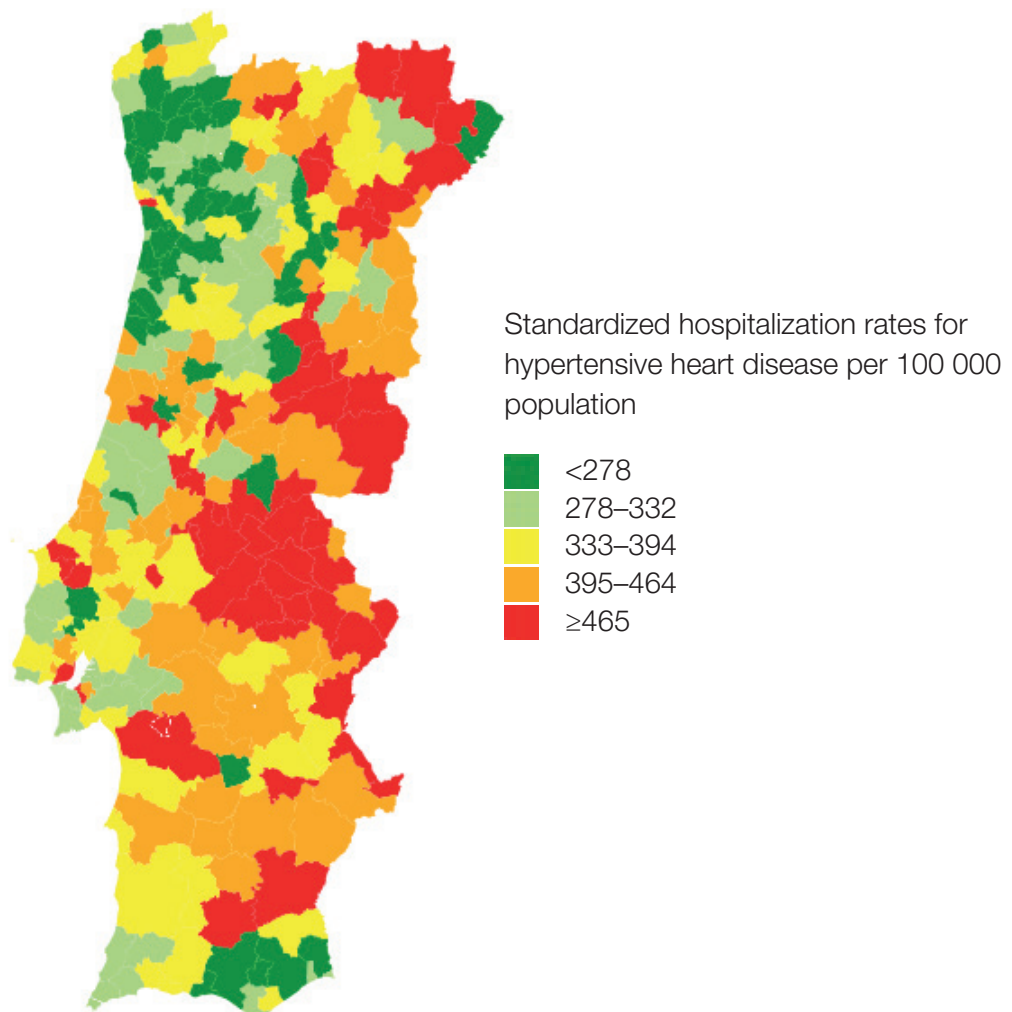
3.2.3 COPD

COPD caused 17 734 hospitalizations (14.4% of all hospitalizations for ACSCs) in 2013. The greatest regional difference of all three priority ACSCs is for COPD: the municipality of Aguiar da Beira (Guarda district) had a rate more than 22 times higher than the municipality of Alcochete (Setúbal district), with 976.3 and 43.5 hospitalizations per 100 000 population respectively. The average rate was 263.0 hospitalizations per 100 000. Hospitalizations were more frequent in men (54.2%) and among the population aged 60 years and older (87.4%).

The regional distribution (Fig. 11) shows another regional pattern with clusters of high COPD hospitalization rates in the districts of Bragança, Viseu and Vila Real, and lower rates in the Alentejo region.

Surveyed PCPs have indicated that approximately 61% of all hospitalizations for COPD could have been avoided by more effective provision of services, which is lower than the 76% estimate reported in the German study *(6)*.

Fig. 11. Regional variations in hospitalization rates for COPD per 100 000 population, mainland Portugal, 2013

Standardized hospitalization rates for COPD per 100 000 population

- <116
- 116–170
- 171–219
- 220–317
- ≥318
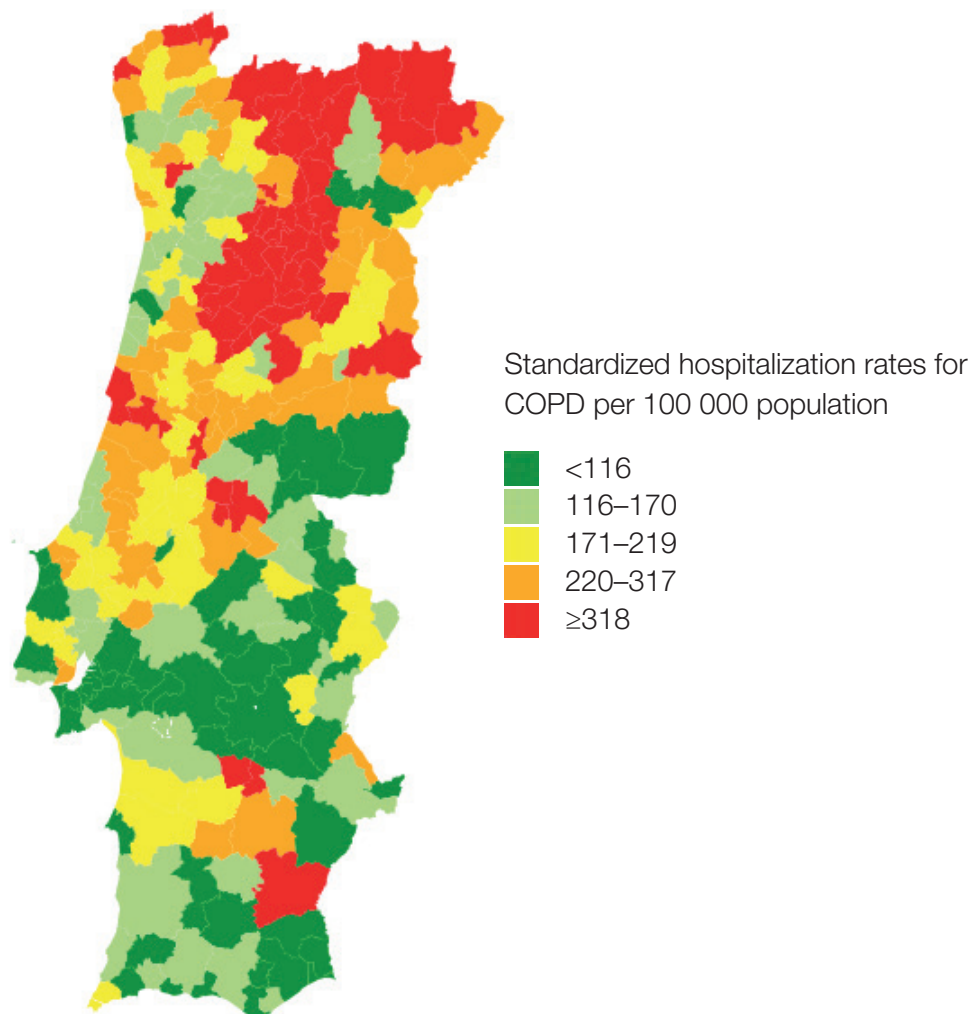
3.3 ACSCs in brief

In Portugal, five ACSCs (COPD, heart failure, hypertensive heart disease, pneumonia and urinary tract infections) account for the highest rates (79%) of ACSC hospitalizations that could be prevented by further strengthening the delivery of services at ambulatory level. Over the last decade, the total number of hospitalizations for ACSCs has risen, as evidenced by the impact of an ageing population with a higher prevalence of chronic diseases. In fact, most hospitalizations in Portugal occurred in persons aged 80–84 years (Fig. 1). Pneumonia, COPD, heart failure and urinary tract infections contribute the most to this increase, while hospitalizations for hypertensive heart disease decreased.

Applying the methodology of stakeholder consultations, three priority ACSCs – COPD, heart failure and hypertensive heart disease – were selected for analysis. These ACSCs account for 42.8% of all hospitalizations attributable to ACSCs in Portugal. Significant regional variations in the rates of hospitalizations occurred across mainland Portugal. Higher hospitalizations rates for heart failure were clustered in the northern and interior regions, as well as in central Portugal, while lower hospitalization rates seemed to cluster closer to the coast and around larger cities (Lisbon, Oporto and Coimbra). Hypertensive heart disease shows a significant difference between the coastal and interior regions of Portugal with higher rates in the latter, especially in the Alentejo region. Finally, COPD higher rates cluster significantly in the districts of Bragança, Viseu and Vila Real with lower rates in the Alentejo region. Regional differences can be explained by differences in distribution and prevalence of selected ACSCs, as well as differences in modalities of services delivery.

Surveyed PCPs considered that on average, 57%, 61% and 66% of hospitalizations for heart failure, COPD and hypertensive heart disease respectively could be avoided by more effective PHC interventions. This means that approximately 32 500 hospitalizations – or the hospitalization of every fourth patient with ACSCs – could have been avoided in 2013. The next section analyses the opportunities for and challenges to improving services delivery for selected ACSCs in Portugal.

4. A health services delivery perspective to ACSCs

Section three showed that the conditions identified as ACSCs with the highest rates of hospitalization also have relatively high rates of preventability in ambulatory settings. This section analyses opportunities and challenges in tackling high hospitalization rates for ACSCs from the perspective of provision of health services, focusing on planning of services, organizing providers, managing services delivery and improving performance that affects the rate of hospitalizations for selected ACSCs.

4.1 Governance and management of health services

4.1.1 Health insurance and coverage of services

Health services are delivered through a mix of public and private providers, with public provision dominant in the primary care and hospital sectors comprising 80.4% of inpatient admissions, 75% of surgeries, 71% of specialist consultations and 91% of ancillary diagnostic procedures (9).

The National Health Service (NHS) is predominantly funded through general taxation and comprises all services and public entities providing health care, namely: groups of primary care centres (ACES), hospitals and local health units (LHUs). Complementarily to the NHS, public servants voluntary contribute 3.5% of their payroll to specific sickness funds that allow access to a private network of providers. Additionally, 20.2% of the population is covered by voluntary health insurance (10) accounting for 5.4% of total health expenditure in 2012. Voluntary health insurance mainly covers diagnostic procedures and consultations with physicians working in private practices.

The NHS aims at comprehensive coverage on a universal basis. However, despite this aim there are several areas where coverage is limited (5). User charges (fixed amount charged for a service) exist for consultations (primary care and hospital outpatient visits), emergency visits, home visits, diagnostic tests and some therapeutic procedures. More than 50% of the population is exempt from paying the user fees due to low socioeconomic status (below the annual income threshold) and/or age. Revenues generated from user fees represent less than 1.5% of the NHS revenue.

4.1.2 Access and out-of-pocket payments

Public sources cover only 59% of outpatient services costs and 47% of medical goods costs. There are fixed co-payments (user fees) that patients pay for every outpatient visit. Cardiovascular medicines are subsidized in 69% of their retail price. Patients with hypertension alone account for 63.3% of ambulatory drugs spending, 39.4% of ancillary diagnostics and 39.8% of medical consultations (11). The NHS subsidizes 90% of insulin and antidiabetic drugs' retail price. Glucometers are distributed free of charge by health care providers. The NHS subsidies 85% of the retail price of test strips and 100% of the retail price of needles, syringes and lancets for patients with diabetes. Oxygen therapy and influenza vaccinations for patients with COPD are free of charge, while smoking cessation programmes are not offered in primary care centres (12).

Public funding of non-ambulatory services is much higher: 86% of inpatient services costs, 96% of day care services costs and 92% of home care services costs. Co-payments for inpatient services were abolished in 2009 (5). Absence of

user fees for hospital-based services influences patients' care-seeking behaviour, resulting in a high number of emergency ward visits and hospitalizations. For example, it is estimated that approximately 40.8% of all patients who have sought care in emergency departments did not have acute symptoms. Furthermore, despite the existence of fixed user charges for emergency care, these are insignificant in comparison to the average total cost of service (€8.75 vs €143.5) and therefore do not serve as a strong mechanism containing its overuse *(5)*.

4.1.3 Availability of after-hours clinics

During weekdays, primary care centres such as family health units (USF) are open from 08:00 to 20:00. Some have extended opening hours until 22:00 and on Saturday mornings until 13:00. Cost constraints faced during years of economic recessions had implications in the number of PHC centres that provide after-hour services. This reduced availability of after-hours contributes to overuse of emergency department.

4.1.4 Availability and distribution of the health workforce

Portugal has a chronic shortage of GPs. Despite the continuous efforts to increase access to family medicine, 1 478 271 people were without a regular GP in 2014, corresponding to 14.5 % of the Portuguese population *(13)*. This shortage is exacerbated by the high numbers of GPs approaching the retirement age *(14)*. It is mostly perceived in Lisbon and other urban and suburban areas rather than in rural areas. Several independent reports advocate to review the current skill mix between health professionals and to introduce human resource reforms that shift health providers from hospitals closer to the community *(15–16)*.

4.2 Models of care

4.2.1 Scope of practice

The PHC basket of services is quite comprehensive including a wide range of services and modalities (i.e. surveillance, health promotion and disease prevention, acute/chronic disease management, home care, continuity and coordination of care), administrative assistance, prolonged opening hours, defined patients list per doctor and additional services. According to the guiding health policy strategies, all clinical services must follow objectives of prioritizing women's health, adult and elderly care.

4.2.2 Integrated care management

In compliance with the National Strategy for Quality in Health and the National Health Plan 2012–2016, the Directorate-General of Health started the publication of integrated care pathways (ICPs) in 2013. ICPs address services that are delivered at the different levels of care and cover both chronic and acute phases of the disease. The pathways require effective coordination of medical and nursing care within hospital services, PHC and long-term care units. Pathway development starts with a pilot team, and is then scaled-up through peer-to-peer training, clinical and organizational briefings, interlevel care meetings and resource allocation strategies. It is expected that ICPs will improve patient-centred care services delivery along with coordination of care and population risk stratification. There is also an expectation that the pathways will support greater synergy between financing, clinical practices, quality and safety *(16)*.

ICPs for type 2 diabetes mellitus and cardiovascular diseases were published in 2013 and 2014 respectively, clearly defining the role of each health care provider, and volume of services ought to be provided at each level of care

(Fig. 12). The success in the uptake of the ICPs for diabetes and hypertension care may have contributed to the decreasing trend of respective hospitalizations in recent years. In the case of COPD, significant barriers to provision of services in primary care are current regulations that require that the confirmation of diagnosis and initial prescription of oxygen therapy to be done in hospitals settings only, often leading to underdiagnosing and low alertness of primary care providers towards COPD *(17)*.

Fig. 12. Diabetes type 2 ICP
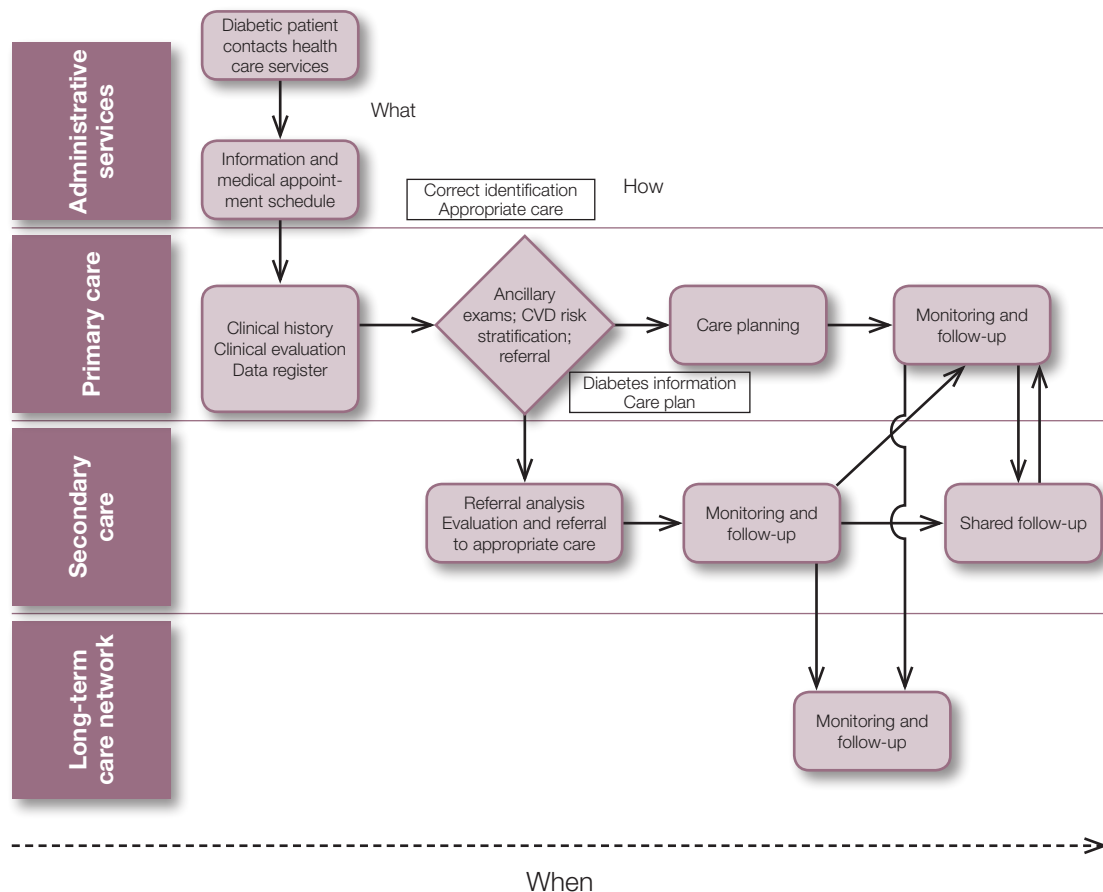
CVD: cardiovascular disease.

Source: Translated and adapted with the permission from the Directorate-General of Health of Portugal *(18)*.

4.2.3 Care coordination and discharge planning

Care coordination units between PHC and hospitals were established in Portugal since 2013. Such care coordination units are composed of health professionals from the different levels of care. For example, the diabetes care coordination units support the flow of clinical information between the family medicine teams and hospital specialists, and develop annual action plans for improving the coordination of care. Inpatient care teams have the responsibility to prepare patient discharge during the first 48 hours and to identify patients potentially in need of long-term care (through

inpatient facilities or home care). Nonetheless, this practice is yet to be scaled-up throughout the country, being cautious about the fact that it can result in prolonged lengths of stay and undesirable readmissions.

4.3 Organization of providers

4.3.1 Primary care

Primary care is provided by personalized health care units [unidades de cuidados de saúde personalizados (UCSPs)] and family health units [unidades de saúde familiares (USFs)]. UCSPs are traditionally publicly managed clinics consisting of varying numbers of GPs and nurses. Even though, UCSPs and USFs are public providers and staffed by public servants, they all differ in staff size and structure, and have different contracting arrangements and payment mechanisms. The number of USFs has been increasing steadily and equalled 418 in 2014, covering 49.4% of the population *(13)*.

USF were introduced in 2006 and are small multiprofessional units (doctors, nurses and clinical assistants) with functional and technical autonomy, which provide primary care services to a defined population within a framework of contracting, involving adjusted capitation and pay for performance (P4P) according to objectives of accessibility, effectiveness, efficiency and quality. The average USF has around 12 000 patients, which are serviced by 20 professionals in total, including seven GPs.

In addition to UCSPs and USFs, some primary care services are delivered in community care units [unidades de cuidados na comunidade (CCUs)] and units of shared care resources [unidades de recursos assistênciais partilhados (URAPs)]. These units are constituted by allied health professionals, who complementarily provide PHC services, as psychologists,

nutritionists and oral hygienists. In 2014, there were 237 CCUs, which provided care to groups with special needs and deliver community interventions, such as school health activities *(13)*. The number of URAPs across Portugal is expected to be scaled up over the next years.

4.3.2 Gatekeeping

Within the Portuguese health insurance system, primary care providers serve as gatekeepers in accessing health services and, therefore, citizens should normally be assigned to a GP within their residential area. Within the assigned residential area, the population has a free choice of a GP. Nevertheless, approximately 14.5% of the population did not have a regular GP *(18)*.

4.3.3 LHUs

Besides horizontal integration, Portugal started vertical integration from 1999 with the creation of LHUs. These organizations are responsible for primary and secondary levels of care, providing comprehensive health care services on a population-based approach. Currently the eight LHUs cover approximately 12% of the Portuguese population. LHUs are seen as central to meet the challenge of providing effective and coordinated care for patients with multiple needs. A recent study shows that implementation of LHUs reduced the hospital inpatient use, when compared with non-LHU hospitals *(19)*. Nevertheless, the levels of information and clinical integration need improvement *(20)*. In terms of legal framework, LHUs are state owned enterprises and are financed through a prospective global budget based on risk-adjusted capitation and P4P since 2009 *(21)*. P4P is responsible for 10% of the potential annual revenue and takes into account several population-based quality indicators.

4.3.4 Long-term care network

The long-term care network has been established since 2006 in a joint initiative by the Ministry of Health and the Ministry of Labour, Solidarity, and Social Security. The main focus of this network is to provide services in convalescent, intermediate and palliative care. The premises for convalescent care are usually hospital-based and provide permanent (up to 30 days) services aimed to clinically and functionally stabilize patients after acute episode of illness. Intermediate care is also usually hospital-based but is provided for patients who require longer, but still permanent, rehabilitative care (30–90 days). Long-term and palliative care is provided in inpatient settings within their own physical space *(5)*. Home care is provided mainly by specialized CCUs that have the capacity to provide care to 6776 patients simultaneously *(13)*. The LHU model seems in theory able to overcome the aforementioned obstacles by integrating PHC and hospitals into single providers; however, evidence shows that so far only marginal gain has been achieved *(22,23)* and that the clinical integration needs further development *(19)*.

4.3.5 Using technology to coordinate

The Portuguese health system has a particularly rich information infrastructure, which covers almost the whole system *(16)*. The NHS relies on the widespread utilization of electronic patient records and unique patient identifiers. Electronic health records are widespread through PHC, allowing access to some hospital-related data (e.g. discharge summaries, diagnostic test results). Referral to specialist outpatient services is made electronically. The information technology (IT) system in place allowed acceleration of referral practices and waiting times. Referral criteria are specifically defined per medical specialty or disease. Nonetheless, the share of information between different levels of care and health care providers continues to be a challenge due to constraints in interoperability of the software used.

4.4 Performance and quality improvement

4.4.1 Providers payment mechanism

In Portugal, P4P was implemented in 2006 as part of a comprehensive primary care reform. Since then, three types of primary care units have been coexisting:

1. UCSPs correspond to traditional primary care centres, where physicians, nurses and assistants are paid fixed salaries.

2. With USF type A, teams receive incentives for reaching pre-defined targets for a list of indicators. Team incentives are financial rewards that can only be used at the institution level, mainly to improve the working conditions and to finance the training of health professionals.

3. With USF type B, teams receive incentives including also individual incentives on top of fixed salaries, and family physicians receive financial rewards depending on their patient list (a capitation-like system), home visits (fee-for-service) and P4P.

Nowadays, local contractors have more than 100 performance indicators that measure quality, access, efficiency and patients' satisfaction. When compared to UCSPs, USFs are reported to provide more efficient services of higher quality *(24,25)*. The proportion of controlled diabetics and hypertensive patients with controlled blood pressure are much higher in USFs than in UCSPs suggesting that P4P plays a major role in secondary prevention efforts *(26,27)*.

All hospitals are financed through contracts (contratos-programa or contratos de gestão) assuming an explicit purchaser–provider split. State-owned hospitals are financed through prospective global budgets based on negotiated contracts with the regional health authority. The global budget is made up of an activity-based prospective payment model involving systematic diagnosis-related groups and case-mix adjustment for inpatient (45%) and ambulatory surgery (9%), while the remaining hospital revenue comes from outpatient services (17%) and emergency visits (8%), bundled payments (for some chronic conditions) (10%), and some quality-based payments (5%) *(21)*. Public–private partnership contracts consider different prices (according to the initial tender) and performance targets, being more rigid, detailed and demanding.

4.4.2 Waiting times

Portugal has long waiting times for outpatient specialist appointments and elective surgery, although good progress has been achieved in a last decade *(5)*. The median waiting time for outpatient appointments was 81.5 days[3] in 2013 *(13)*, which can explain the high utilization of private outpatient services *(11)* and the high out-of-pocket payments *(28)*. Waiting times for elective surgery, despite being still high, have been progressively decreasing. In 2005, a waiting time and waiting list management system was created based on a centralized electronic platform allowing more smooth transition of patients within the health system. The system allows the transfer of patients to another hospital (either public or private) when 75% of the maximum waiting time is reached. From 2006 to 2013, the median waiting time for surgery has been reduced by 58.9%, representing

progress in improving the performance of service delivery *(29)*.

4.4.3 Update and access to clinical protocols

Clinical guidelines, which are mandatory and widely used, are a joint responsibility of the Ministry of Health and the Portuguese Medical Association (representing all medical specialties). They are responsible for development and implementation of clinical guidelines and ICPs, as well as evaluation of their applicability and impact. They are also responsible for the training of clinical auditors and performance of clinical audits. Clinical auditors carry out audits in hospitals, primary care units and LHUs, and across all regions. Early results suggest that compliance with guidelines is much better in hospitals with an average of 58% compliance across Portugal compared to 32% in audited primary care facilities *(5)*.

4.4.4 Length of hospital stay

The Portuguese health system relies heavy on the hospital sector. Average length of stay in hospitals was 8.9 days in Portugal higher than the Organization for Economic Co-Operation and Development average of 8.1 days *(30)*. Portuguese hospitals have a higher average length of stay when compared to the European Union countries. Specialists attribute this, in part, to the absence of an adequate offer of post-discharge recovery facilities. The expanding chronic care network may be a solution to this problem; however, other solutions such as shared decisions and shared responsibilities of discharge between hospital and primary care can also be an option. Although the discharge teams are widespread in hospitals, the discharge process does not actively involve GPs.

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[3]   Waiting time is measured from family physician referral to hospital specialist appointment.

4.5 Health services delivery for ACSCs in brief

This subsection summarizes the opportunities and challenges to adequately address ACSCs in Portugal.

4.5.1 Governance and management of health services

Contrasting with the higher level of cost-sharing in the outpatient settings, low user fees for emergency visits and absence of co-payments for hospitalizations are the major driving force behind the overuse of emergency and hospital services. Furthermore, the unequal distribution of GPs, geographical remoteness of primary care providers in rural areas and lack of out-of-hour access also contribute to a high number of hospitalizations in Portugal. Additional opportunities for better provision of services for selected ACSCs exist in better alignment of provider payment mechanisms and expanding use of IT for governance and management of health services.

4.5.2 Models of care

The lack of integration between levels of care has been widely pointed out by experts as an obstacle to reducing hospitalizations for ACSCs. This is particularly relevant in the case of the selected priorities as chronic and multimorbid patients demand complex and continued interventions. This often implies aligned interventions across levels and sectors that are not fully or easily achieved. Some important initiatives exist, such as update of clinical guidelines, the recent ICPs and the development of shared medical records; however, these tools are not yet fully assimilated in the daily practice. Moreover, referral protocols and strategies differ geographically, despite the unified IT solution for the process itself. The implementation of joint case management protocols between hospitals and PHC may

contribute to reduction of hospitalizations for the selected ACSCs.

4.5.3 Organization of providers

The current organization of providers does not favour the patient-centredness that would allow for joint actions towards the prevention and reduction of ACSCs. Namely, the existence of separate financing schemes, managing structures, clinical records and access pathways between hospitals and PHC impedes the continuity of care, which is necessary when addressing complex heath needs. The skill-mix of the PHC providers could be adjusted to the needs of patients at risk of being admitted for an ACSC. The LHU model seems, in theory, able to overcome the aforementioned obstacles by integrating PHC and hospitals into single providers; however, evidence shows that so far only marginal gain has been achieved and that the clinical integration needs further development.

4.5.4 Performance and quality improvement

The median waiting time for outpatient appointments is 81.5 days, and some specialities in hospitals have significantly higher waiting times. Portuguese hospitals have a higher average length of stay when compared to the European Union countries. Specialists attribute this, in part, to the absence of an adequate offer of post-discharge recovery facilities. Although discharge teams are widespread in hospitals, the discharge process seldom includes the GPs' knowledge and contribution. The PHC reform seems to have had important impact although evidence on this subject needs strengthening; an important part of this impact may be attributed to the P4P payment schemes. The introduction of indicators and objectives related to the ACSC hospitalization reduction may be an opportunity to drive PHC providers' attention.

5. Policy recommendations

This section provides an overview of the main elements to improve the prevention, diagnosis, and treatment of selected ACSCs in Portugal. It is based on the overview of the main policy actions identified by experts in stakeholder consultations that took place in September 2015. Actionable policy recommendations are complemented with an indicative timeline (short, medium or long term) and the suggestion of relevant stakeholder(s) to be engaged in the implementation policy and practice.

5.1 Expand and align the PHC service package to population needs

The absence or misalignment of several types of services available to patients with ACSCs was seen as an obstacle to preventing ACSC-related hospitalizations. Expanding and aligning the availability of these services around population needs will ensure that ACSCs are prevented or addressed in a timely manner (Table 2).

Table 2. Policy recommendations on expanding the PHC service package

Recommendation	Timeline	Relevant stakeholders
Introduce effective risk stratification and monitoring of high-risk patients in primary care	Short-term	ACSS, ACES, hospitals, LHUs
Engage patients with chronic diseases in self-care through provision of specialized trainings and counselling services in PHC	Short-term	ACES, hospitals, LHUs, USFs, UCSPs, CCUs
Include smoking cessation programmes for patients with COPD in the PHC service package	Short-term	Ministry of Health, ACSS, ACES, LHUs
Introduce case management in the PHC service package, especially for patients frequently admitted to hospitals	Medium-term	Ministry of Health, ACSS, ACES, LHUs
Expand coverage with out-of-hours ambulatory services to ensure timely provision of care on early stages of (sub)acute disease episodes	Medium-term	Ministry of Health, ACSS, ARS, ACES, LHUs
Include telemedicine consultations in the PHC service package to address regional and geographic disparities in accessibility of care	Medium-term	Ministry of Health, ACSS, Shared Services of the Ministry of Health (SPMS), ARS
Ensure geographical accessibility of diagnostic services such as X-rays, laboratory tests, spirometry etc.	Medium-term	ARS, ACES, hospitals, LHUs

ARS: regional health administrations [Administrações Regionais de Saúde].

5.2 Reinforce the care coordinating role of GPs

Despite a formal gatekeeping system in the Portuguese health system, the majority of patients with ACSCs address their health concerns directly to specialists or hospitals. Furthermore, data analysis has shown the prevailing trend of more episodes of hospitalization in recent years, drawing attention to the issue of hospital readmissions and frequent admissions among older patients. Therefore, patients with selected ACSCs, which are all chronic in nature, require continuous care that should ideally be coordinated by GPs in primary care (Table 3).

Table 3. Policy recommendations for advancing use of CGPs

Recommendation	Timeline	Relevant stakeholders
Reinforce the role of GPs as the first contact point and their coordinating role through wider dissemination of disease management programmes for selected chronic conditions	Medium/ Long-term	ACSS, ARS, ACES,LHUs
Ensure accessibility of patients' electronic health records for out-of-hour and inpatient care episodes with the aim of facilitating the provision of timely care and avoiding the duplication of diagnostic and laboratory procedures	Short-term	SPMS
Introduce obligatory PHC-led post-hospitalization follow-ups for patients with selected ACSCs, including follow-up on recommendations of the discharge letters	Medium-term	ACSS, ARS, ACES, LHUs, hospitals

5.3 Accelerate the uptake and implementation of integrated models of care

Portugal has a wide range of integrated care initiatives applied in the network of ambulatory care providers.

However, their implementation is still fragmented across the levels of care and has regional discrepancies in their uptake. The role of LHUs, created with the aim of integration between levels of care, should be reinforced and serve as a platform in the uptake of ICPs (Table 4).

Table 4. Policy recommendations on strengthening the implementation of integrated services delivery

Recommendation	Timeline	Relevant stakeholders
Accelerate the development and uptake of ICPs for all selected ACSCs	Short-term	Directorate-General of Health, ARS, ACES, LHUs, hospitals
Expand the interoperability of e-health services across providers and level of care to ensure effective two-way information flow	Medium-term	SPMS
Increase the number of inter- and multidisciplinary teams to deal with patients with multimorbidity (nutritionists, psychologists, physiotherapist, social services, etc.)	Medium-term	ARS, ACES, LHUs, hospitals
Strengthen the role of LHUs in linking between ambulatory and hospital services, coordinating and aligning the transition of patients between levels of care	Medium/ Long-term	ARS, LHUs

5.4 Mainstream the long-term care for patients in nursing homes

Data analysis has shown that patients aged 80–84 years account for a high number of ACSC-related hospitalizations (Fig. 1), representing a cluster of patients who are frequently admitted and readmitted to hospitals. Expanding the coverage of long-term care services for patients in nursing homes is one of the strategies that will improve ACSC-related health outcomes (Table 5).

Table 5. Policy recommendations on long-term care for patients in nursing homes

Recommendation	Timeline	Relevant stakeholders
Promote the enrolment of patients living in nursing homes with a regular primary care provider (GP)	Short-term	Nursing homes, ARS, ACES, LHUs
Introduce domiciliary GP visits to nursing home patients	Short-term	Nursing homes, ARS, ACES, LHUs
Introduce nursing home-based monitoring and long-term care for patients with selected ACSCs	Medium-term	Nursing homes, ARS, ACES, LHUs

5.5 Monitor and improve performance on ACSCs

The number of ACSCs and other related performance indicators are not routinely collected and analysed in Portugal. Introducing ACSCs as a performance indicator of care quality and coordination will help in identifying service gaps and aligning provider incentives (Table 6).

Table 6. Policy recommendations for improving performance on ACSCs

Recommendation	Timeline	Relevant stakeholders
Reduce waiting times for specialist consultations by redirecting patients to specialists in other districts	Short-term	ARS, ACES, LHUs, hospitals
Review and align the performance indicators currently used to address quality of care through a consultative process with GPs	Short-term	Ministry of Health, ACSS
Introduce the number of preventable ACSC hospitalizations as a performance indicator for LHUs, and routinely monitor and evaluate it	Short-term	ACSS
Link incentives paid to primary care providers and local health units to their performance on ACSCs (using the positive experience of P4P for diabetes and hypertension)	Medium-term	ACSS
Improve compliance to clinical guidelines in ambulatory settings through specific trainings for providers, including those described in ICPs	Medium-term	Directorate-General of Health, Portuguese Medical Association
Evaluate good practices in reducing hospitalizations for diabetes and hypertension and apply lessons learnt to other ACSCs	Medium-term	Ministry of Health, Portuguese Medical Association

References[4]

1. A Saúde dos Portugueses: Perspetiva 2015 [The health of the Portuguese. Perspective 2015]. Lisbon: Directorate-General of Health of Portugal; 2015 (in Portuguese).

2. Caminal J, Starfield B, Sánchez E, Casanova C, Morales M. The role of primary care in preventing ambulatory care sensitive conditions. Eur J Public Health. 2004;14(3):246–51.

3. Nedel F, Facchini L, Bastos J, Martín-Mateo M. Conceptual and methodological aspects in the study of hospitalizations for ambulatory care sensitive conditions. Cien Saude Colet. 2011;16(Supl 1):1145–54.

4. Caminal J, Mundet X, Ponsà J, Sánchez E, Casanova C. Las hospitalizaciones por ambulatory care sensitive conditions: selección del listado de códigos de diagnóstico válidos para España [Hospitalizations due to ambulatory care sensitive conditions: selection of diagnostic codes for Spain]. Gac Sanit. 2001;15(2):128–41 (in Spanish).

5. Barros P, Machado S, Simões J. Portugal: Health system review. Health Systems in Transition. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies; 2011 http://www.euro.who.int/__data/assets/pdf_file/0019/150463/e95712.pdf).

6. Ambulatory care sensitive conditions in Germany. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/en/countries/germany/publications/ambulatory-care-sensitive-conditions-in-germany-2015).

7. Ambulatory care sensitive conditions in Kazakhstan. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/en/countries/kazakhstan/publications3/ambulatory-care-sensitive-conditions-in-kazakhstan-2015).

8. Ambulatory care sensitive conditions in the Republic of Moldova. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/en/countries/republic-of-moldova/publications2/ambulatory-care-sensitive-conditions-in-the-republic-of-moldova-2015).

9. Dia Mundial da Saúde – 2002–2012 [World Health Day – 2002–2012]. Lisbon: Statistics Portugal; 2014 (in Portuguese).

10. Os seguros de saúde e o acesso dos cidadãos aos cuidados de saúde [Health insurance and citizens' access to health care]. Porto: Portuguese Health Regulation Authority; 2015 (in Portuguese).

11. Lourenço A, Mestre R, Sousa N. Noncommunicable diseases prevalence, treatment costs and the concentration of primary health care resources in Portugal (2013). 14th National Conference of Health Economics, 15–16 October 2015. Lisbon: Portuguese Association for Health Economics; 2015.

12. Prevenção e Controlo do Tabagismo em Números – 2014 [Prevention and tobacco control in numbers – 2014]. Lisbon: Directorate-General of Health of Portugal; 2014.

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[4] References accessed on 15 October 2015.

13. Relatório anual sobre o acesso a cuidados de saúde nos estabelecimentos do SNS e entidades 2013 [Annual report on access to health care in the NHS establishments and entities 2013]. Lisbon: Ministry of Health of Portugal; 2014; (in Portuguese).

14. Santana P, Peixoto H, Loureiro A, Costa C, Nunes C, Duarte N. Estudo de evolução prospectiva de médicos no sistema nacional de saúde [Prospective development study of doctors in the national health system]. Coimbra: University of Coimbra on behalf of the Portuguese Medical Association; 2013 (in Portuguese).

15. Crisp N, Berwick D, Kickbusch I, Bos W, Lobo Antunes J, Pita Barros P, et al. The future for health – Everyone has a role to play. Lisbon: Calouste Gulbenkian Foundation; 2014.

16. Organization for Economic Co-operation and Development. OECD reviews of health care quality: Portugal 2015 – Raising standards. Paris: OECD Publishing; 2015.

17. Metodologia de Contratualização para os Cuidados de Saúde Primários no ano de 2015 [Contracts methodology for primary health care in 2015]. Lisbon: Central Administration of the Health System; 2014 (in Portuguese).

18. Processo Assistencial Integrado da Diabetes Mellitus tipo 2 [Integrated Care Pathways in Diabetes Mellitus type 2]. Lisbon: Directorate-General of Health of Portugal; 2013.

19. Santana RM, Ferreira M, Sarmento J, Marques AP, Matos R, Perelman J. The impact of creating vertically integrated organizations on hospital inpatient use. Int J Integr Care. 2015;15 (Annual Conf Suppl).

20. Santana RM, Marques AP, Mestre R, Torres T, Lopes P, Lourenço A, et al. Recent evolution of the degree of integration on vertically integrated organizations. Int J Integr Care. 2015;15 (Annual Conf Suppl).

21. Contrato Programa 2015: Metodologia para definição de preços e fixação de objetivos [Contract Programme 2015: Methodology for pricing and goal setting]. Lisbon: Central Administration of the Health System; 2014 (in Portuguese).

22. Sarmento J. Internamentos por Causas Sensíveis a Cuidados de Ambulatório em contexto de integração vertical [Hospital admissions for ambulatory care sensitive conditions in the context of the vertical integration]. Lisbon: Universidade NOVA de Lisboa; 2012 (in Portuguese).

23. Indicadores e metas em saúde [Indicators and health goals]. In: Plano Nacional de Saúde 2012–2016 [National health plan 2012–2016]. Lisbon: Directorate-General of Health of Portugal; 2012 (in Portuguese).

24. Auditoria ao desempenho de unidades funcionais de cuidados de saúde primários [Audit of the performance of functional units of primary health care]. Lisbon: Court of Auditors; 2014 (in Portuguese).

25. Fialho AS, Oliveira MD, Sa AB. Using discrete event simulation to compare the performance of family health unit and primary health care centre organizational models in Portugal. BMC Heal Serv Res. 2011;11:274.

26. Barros PP, Lourenço A, Moura A, Correia F, Silvério F, Gomes JP, et al. Políticas Públicas em Saúde: 2011–2014 Avaliação do Impacto [Public policies in health: 2011–2014 impact assessment]. Lisbon: Nova Healthcare Initiative – Research; 2015 (in Portuguese).

27. Perelman J, Lourenço A. Effectiveness of pay-for-performance in primary care: the Portuguese experience. Eur J Public Health. 2015:25(Suppl 3).

28. Conta Satélite da Saúde 2012–2014Pe. Em 2014, a despesa corrente em saúde aumentou 1,3% [Satellite Account of Health 2012–2014. In 2014, the current health expenditure increased by 1.3%]. Lisbon: Statistics Portugal; 2015 (in Portuguese).

29. Relatório da Atividade em Cirurgia Programada – Ano 2013 [Activity report on scheduled surgery – 2013]. Lisbon: Central Administration of the Health System; 2014 (in Portuguese).

30. Health at a Glance: OECD Indicators. 2015. Paris: OECD Publishing; 2015.

Annex 1. Summary of the analytical framework

The analytical framework draws from existing literature to identify those elements of a health system that are instrumental in strengthening health service delivery to better respond to the challenges on diagnosing and treating ACSCs. The analytical framework is intended as a tool for assessing opportunities and challenges of providing the right service in the right place for the patients with conditions that could be treated at ambulatory settings.

Forty-four features of health systems influence the hospitalization of patients with ACSCs as identified through literature research. These features have been depicted from a health service delivery perspective as: governance and management of services, model of care, organization of providers and improvement of performance.

The **governance and management of service delivery** refers to the oversight of operations in the delivery of care – ensuring that desired outcomes are attained, that departments within a health facility are running smoothly, that the right people are in the right jobs, that people know what is expected of them, that resources are used efficiently and that all partners in the production of services are working together to achieve a common goal. The task of management comprises the thoughtful design and resourcing (encompassing all resources: human, financial, consumables and technologies) to best direct the provision of care, whether it be for an oblast-level tertiary hospital or a singular health house or polyclinic in a rural area .

The second area of health service delivery calling for attention is the **model of care** – referring more specifically to *what* services are provided and *how* the provision of services is perceived and experienced by the individual. In articulating a pathway for clinical and social care, patient flows are made common and known, and referrals along the full continuum of service delivery can be clarified, for example, the foundation for more coordinated/integrated care that is people-centred rather than illness or disease specific .

The **organization of providers** refers to the structure and arrangement of the so-called hardware of the system – the *who* and the *where* in the production of services – looking specifically to the mix of providers in the health sector, their scope of practice, and how they operate as a collective profession, in both the public and private sector. The organization of providers is a determining factor for ensuring models of care are actualized, and thus, the extent to which needed services are received at the right time and in the right way, optimizing health results and improving the patient experience. To treat a patient's full health care needs, numerous health care providers may be called upon, in different settings – such as primary, secondary and tertiary care – and in different capacities – for consultation in diagnosis, the development of a treatment plan, counselling or rehabilitation. To optimize this process, organizational strategies, like the introduction of multidisciplinary teams and group practices in PHC, or the expansion of provider profiles and their alignment for shared-care tasks may be called upon. Whichever means to designing the flow of services, these efforts share in their common objective to promote diversity in technical expertise – found in strong association with the ability of the system to respond to the population's increasingly complex health needs.

Mechanisms for **continuous performance improvement** refer to those efforts that aim to safeguard the delivery of services, creating a learning system through the standardized models of care, regular monitoring of the provision of care and feedback loops allowing a continuous critique of the provision of care, with opportunities and resources (skills, time, authority) for improvement . Creating a system of learning calls attention to the principles of collegiality and autonomy, fuelled by a sense of responsibility, peer pressure and a common transformative culture. Measures to cultivate this may include for example, the standardization of training and retraining requirements as well as (re)accreditation and certification schemes for health professionals, each providing systematic incentives for providers to adhere to certain standards of quality and regularly improve their practice.

Summary of the methodology

The study on ACSCs followed certain standard steps.

1. Conduct desk research to retrieve information regarding the indicators of the analytical framework and identify key stakeholders in each country for an online meeting or as survey participants.
2. Analyse hospitalization data to select high potential (i.e. top 10) ACSCs per country.
3. Organize an online meeting or hold a survey to introduce the study to relevant stakeholders and invite them to select a limited number (2–4) of ACSCs per country.
4. Hold a local country stakeholder meeting in the form of a two-day workshop to identify challenges and opportunities for strengthening the PHC related to the selected ACSCs. Possibly follow-up with additional interviews if the stakeholder meeting in the form of a workshop does not yield sufficient information.
5. Calculate potential savings for the selected ACSCs (depending on the availability of data).
6. Draw relevant lessons and formulate actionable policy recommendations for each selected country.
7. Deliver country reports, including an interpretation of results and actionable policy recommendations for the relevant country.

Annex 2. Survey questionnaire on avoidable hospitalizations in Portugal

Personal information

Question 1. Professional category

(a) Specialist in general and family medicine
(b) Undifferentiated primary care physician
(c) Resident in general and family medicine

Question 2. Age (in years)

(a) Under 25
(b) 25–29
(c) 30–34
(d) 35–44
(e) 45–54
(f) 55 and over

Question 3. Region of practice (corresponds to the regional health administrations)

(a) North
(b) Centre
(c) Lisbon and Tagus Valley
(d) Alentejo
(e) Algarve
(f) Azores
(g) Madeira

Question 4. Based on conditions presented in Table A2.1, please rank the six ACSCs that should receive the highest priority in Portugal (in descending order).

(a) Priority 1
(b) Priority 2
(c) Priority 3
(d) Priority 4
(e) Priority 5
(f) Priority 6

Table A2.1. List of ACSCs

ACSCs	
Acute tonsillitis	Hypokalaemia
Appendicitis with complications	Iron deficiency anaemia
Asthma	Meningitis by haemophilus
Bleeding/perforated ulcers	Pelvic inflammatory disease
Congenital syphilis	Peritonsilar abscess
Convulsions	Pneumonia
COPD	Poliomyelitis
Dehydration	Rheumatic fever
Diabetes	Skin infections
Diphtheria	Suppurated otitis media
Gastroenteritis	Tetanus
Heart failure	Tuberculosis
Hypertensive heart disease	Urinary tract infections

Source: Caminal J et al (1).

Question 5. Please explain why you selected the conditions above as the most important ACSCs in Portugal.

> **Please explain why you selected the conditions above as the most important ACSCs in Portugal.**

Question 6. Which percentage of hospitalizations for conditions listed in Table A2.1 could be avoided when an ACSC would be effectively treated in PHC?

> **Which percentage of hospitalizations for conditions listed in Table A2.1 could be avoided when an ACSC would be effectively treated in PHC?**

Question 7. In your opinion, what should happen in Portugal to effectively address the selected conditions in PHC?

> **In your opinion, what should happen in Portugal to effectively address the selected conditions in PHC?**

Comments

If you wish to make any further comments about your experiences with ACSCs in your country and/or this survey, please use the space provided below.

Reference to Annex 2

1. Caminal J, Mundet X, Ponsà J, Sánchez E, Casanova C. Las hospitalizaciones por ambulatory care sensitive conditions: selección del listado de códigos de diagnóstico válidos para España [Hospitalizations due to ambulatory care sensitive conditions: selection of diagnostic codes for Spain]. Gac Sanit. 2001;15(2):128–41 (in Spanish).

Annex 3. Percentage of avoidable ACSC hospital admissions according to the surveyed PCPs

ACSCs	Minimum (%)	Maximum (%)	Mean (%)	Standard deviation
Acute tonsillitis	0	100	84.11	27.77
Urinary tract infections	5	100	74.11	26.09
Tetanus	0	100	72.91	38.23
Iron deficiency anaemia	10	100	72.68	27.23
Gastroenteritis	0	100	70.45	26.99
Asthma	10	100	69.26	22.63
Diabetes	10	100	69.17	23.48
Skin infections	5	100	68.17	28.71
Suppurative otitis media	0	100	67.13	32.69
Hypertensive heart disease	10	100	66.38	24.80
Rheumatic fever	0	100	62.19	33.72
COPD	15	100	61.81	23.14
Dehydration	0	100	59.83	27.50
Congenital syphilis	0	100	58.87	41.39
Heart failure	1	90	57.36	21.31
Poliomyelitis	0	100	56.06	45.06
Pneumonia	0	100	55.85	25.76
Tuberculosis	0	100	55.26	26.07
Diphtheria	0	100	53.40	44.83
Pelvic inflammatory disease	0	100	48.36	29.04
Hypokalaemia	0	100	46.32	31.20
Peritonsilar abscess	0	100	40.19	37.64
Meningitis by haemophilus	0	100	40.06	38.35
Bleeding/perforated ulcers	0	100	38.72	31.72
Convulsions	0	90	36.38	30.01
Appendicitis with complications	0	100	25.85	32.19

Annex 4. Questionnaire used at the workshop with health professionals and health system/policy delegates, 18 September 2015, Lisbon, Portugal

Group	Questions
Group A	1. What measures should be implemented to increase access to after-hours care in order to avoid hospitalizations for the priority ACSC? 2. What case management measures can help prevent hospitalizations for the selected ACSC? 3. What measures should be taken to adequately arrange the composition and skill-mix of multidisciplinary teams to avoid hospitalizations for ACSCs? 4. What measures should be implemented to manage patient flows between levels of care in order to avoid hospitalizations for ACSCs? 5. What measures could be implemented to improve the care of institutionalized patients (nursing homes and long-term care) in order to avoid hospitalizations for ACSCs?
Group B	1. What health policy recommendations can promote greater health literacy in the population and thus reduce hospitalizations for ACSCs? 2. What health policies can improve the dietary habits of the population in order to avoid hospitalizations for the selected ACSC? 3. What antismoking policies can be implemented to avoid hospitalizations for the priority ACSC? 4. What measures can be implemented to facilitate primary care access to diagnosis technology essential (blood pressure measuring devices, spirometers etc.) to avoid hospitalizations for the selected ACSC?
Group C	1. What fiscal policies could be applied to avoid hospitalizations for the selected ACSC? 2. What measures could be applied in health system financing in order to avoid hospitalizations for the selected ACSC? 3. What measures in provider payment should be implemented to avoid hospitalizations for the priority ACSC?
Group D	1. What e-Health measures should be implemented in order to reduce hospitalizations for the selected ACSC? 2. What measures in the field of information systems should be implemented in order to reduce hospitalizations for ACSCs?

Annex 5. Description of the dimensions, hypothesis, measures and data source of the variables included in the prioritization model

A prioritization model including dimensions and measures of ACSCs (Table A5.1) was constructed to prioritize the ACSCs that are highly relevant in Portugal. Dimensions and measures were selected for which data are routinely available. The results for each of the measures were transformed into a z-score for comparability between measures. Weighted z-scores were calculated based on the experts' ranking (0–100) of the relevance of the dimensions used in the model. (Table A5.2).

Table A5.1. Characteristics of the ACSC prioritization model

Dimension	Question	Measure	Data source
Volume	Is the ACSC responsible for the highest number of hospitalizations the most important?	Number of hospitalizations for each ACSC in 2013	Hospital discharge database – ACSS
Trend	Is the ACSC with the highest growth trend the most important?	Average of the yearly % of variation in the number of hospitalizations for each ACSC between 2002 and 2013	Hospital discharge database – ACSS
Multimorbidity	Should ACSCs for which patients have a higher number of chronic diseases be addressed first?	Average number of chronic diseases per patient admitted for each ACSC in 2013[a]	Hospital discharge database – ACSS
Complexity	Are the most complex ACSCs the most important?	Case-mix index per ACSC in 2013	Hospital discharge database – ACSS
Financial impact	Is the ACSC responsible for the highest financial impact the most important?	Total estimated financial impact per ACSC in 2013	Hospital discharge database – ACSS
Intervention potential	Should the ACSC with the most potential of intervention be the most important?	Average % of avoidability per ACSC	Primary care physicians questionnaire
Regional asymmetry	Should ACSCs with more regional asymmetry be addressed first?	Standard deviation of the municipal rates of hospitalization for each ACSC	Hospital discharge database – ACSS

[a] Chronic diseases defined according to the Agency for Healthcare Research and Quality *(1)*.

Table A5.2. Experts' ranking of the prioritization model dimensions

Dimension	Experts								Average
	1	2	3	4	5	6	7	8	
Volume	90	90	70	80	80	90	70	100	83.75
Trend	60	80	50	40	30	70	40	80	56.25
Multimorbidity	40	85	80	60	50	80	80	100	71.87
Complexity	50	85	70	60	60	70	80	80	69.37
Financial impact	70	70	40	50	50	60	60	80	60.00
Intervention potential	95	90	80	100	90	90	100	100	93.12
Regional asymmetry	30	75	50	40	20	70	40	50	46.87

Each ACSC then had a final aggregated score of the degree of priority, allowing the selection of the top six ACSCs. Table A5.3 shows the output of the prioritization analysis.

Table A5.3. ACSC prioritization model results

Disease	Volume 2013		Trend 2002–2013		Multimorbidity		Complexity		Financial impact		Intervention potential		Regional asymmetry		Final score
	No. of admissions	Weighted z-score[a]	% variation	Weighted z-score	Average no. chronic conditions	Weighted z-score	Case-mix index	Weighted z-score	Estimated cost of hospitalizations (€)	Weighted z-score	% avoidability	Weighted z-score	Standard deviation rates of admissions	Weighted z-score	
Weight (attributed by the experts)	0.8375		0.5625		0.71875		0.69375		0.6		0.93125		0.46875		–
1 Hypertensive heart disease	34 496	1.84	0.00	–0.09	5.19	1.01	2.49	1.53	163 803 549.06	4.05	66.38	1.07	0.36	0.11	9.53
2 Pneumonia	38 000	2.10	0.03	0.39	3.93	0.43	1.18	0.73	92 938 156.59	2.30	55.85	0.90	0.47	0.15	6.99
3 Heart failure	21 023	0.88	0.03	0.43	6.00	1.39	1.22	0.75	57 666 879.57	1.43	57.36	0.92	0.42	0.13	5.92
4 COPD	19 790	0.79	0.04	0.55	4.72	0.80	0.97	0.60	38 165 788.31	0.94	61.81	0.99	0.68	0.21	4.88
5 Urinary tract infections	17 529	0.63	0.06	0.86	3.44	0.21	0.84	0.52	30 439 406.72	0.75	74.11	1.19	0.59	0.18	4.33
– Congenital syphilis[b]	6	–0.63	0.07	0.99	0.50	–1.16	0.99	0.61	12 463.59	0.00	58.87	0.94	11.34	3.50	4.25
6 Diabetes	7 227	–0.11	–0.01	–0.13	4.24	0.57	1.35	0.83	24 209 274.81	0.60	69.17	1.11	0.61	0.19	3.06
– Infectious diseases[b]	30	–0.62	–0.07	–0.99	4.00	0.46	1.60	0.98	181 898.71	0.00	56.93	0.91	4.83	1.49	2.24
7 Iron deficiency anaemia	1 569	–0.51	0.02	0.20	3.70	0.33	0.75	0.46	2 288 066.58	0.06	72.68	1.17	1.12	0.34	2.04
8 Hydroelectrolytic disorders	2 813	–0.43	0.03	0.36	3.56	0.26	0.77	0.47	4 404 887.35	0.11	53.01	0.85	0.84	0.26	1.88
11 Tuberculosis	1 208	–0.54	–0.05	–0.78	2.51	–0.23	3.00	1.85	9 399 858.32	0.23	55.26	0.89	1.04	0.32	1.74
12 Skin infections	4 076	–0.33	0.03	0.44	2.14	–0.40	0.79	0.48	7 293 178.55	0.18	68.17	1.09	0.70	0.22	1.68
13 Convulsions	4 740	–0.29	0.02	0.19	2.90	–0.05	1.14	0.70	10 516 802.83	0.26	36.38	0.58	0.73	0.23	1.62
14 Asthma	2 781	–0.43	–0.01	–0.23	2.63	–0.17	0.68	0.42	3 353 551.02	0.08	69.26	1.11	0.83	0.26	1.04
15 Bleeding/perforated ulcers	1 915	–0.49	–0.06	–0.82	2.95	–0.02	1.23	0.75	4 838 729.89	0.12	38.72	0.62	0.75	0.23	0.39
16 Gastroenteritis	2 567	–0.44	–0.05	–0.68	2.06	–0.44	0.54	0.33	2 916 107.08	0.07	70.45	1.13	0.88	0.27	0.25
17 Upper respiratory tract diseases	3 351	–0.39	–0.01	–0.92	1.03	–0.92	0.48	0.30	3 258 760.00	0.08	63.81	1.02	0.74	0.23	0.12
18 Pelvic inflammatory disease	846	–0.57	–0.01	–0.21	0.84	–1.00	0.53	0.33	1 079 082.46	0.03	48.36	0.78	1.15	0.35	–0.26
19 Appendicitis with complications	2 224	–0.47	–0.02	–0.28	0.71	–1.06	0.86	0.53	4 074 459.96	0.10	25.85	0.41	0.76	0.23	–0.53

[a] Weighted z-score based on experts' ranking of prioritization model dimensions.
[b] These conditions were excluded from the prioritization model due to the low number of cases.
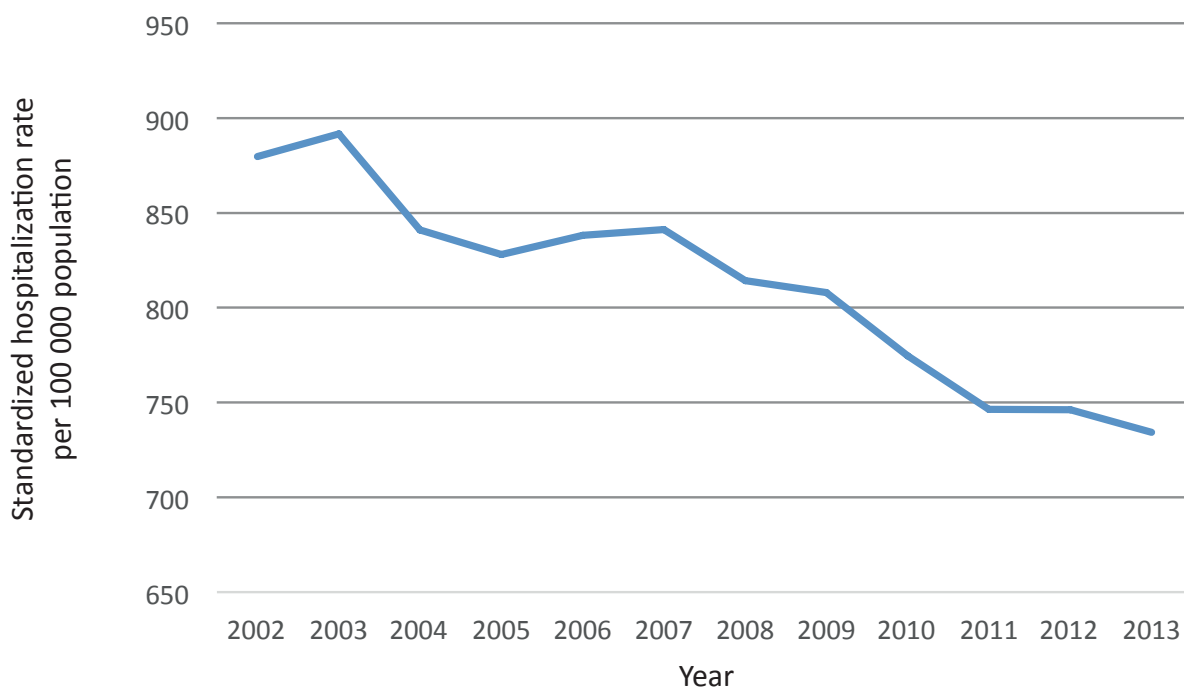
Reference to Annex 5

1. Library of Resources for Chronic Diseases and Related Conditions. In: Agency for Healthcare Research and Quality [website]. Rockville (MD): Agency for Healthcare Research and Quality; 2016. Accessed at http://www.ahrq.gov/professionals/clinicians-providers/ehclibrary/chronic/index.html

Annex 6. Age-standardized rate of hospitalizations for ACSCs in mainland Portugal using WHO European Region standard population

Standardization of rates of hospitalizations attributable to ACSCs using the WHO European Region standard population *(1)* has shown a decreasing trend from 2002 to 2013 (Fig. A6.1). The effect of standardization shows differences in age composition between the younger European standard population and the older Portuguese population (Fig. 3).

Figure A6.1. Standardized hospitalization rate for ACSCs per 100 000 population in mainland Portugal, 2002–2013

Reference to Annex 6

1. European health for all database user manual. Copenhagen: WHO Regional Office for Europe; 2011. Accessed at https://euro.sharefile.com/share?cmd=d&id=sb7422ab51e54f20b#/view/sb7422ab51e54f20b_k=0o6ri5

Annex 7. List of participants of workshop with health professionals, 4 September 2015, Lisbon, Portugal

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