



World Health  
Organization

REGIONAL OFFICE FOR  
Europe

# Addressing the noncommunicable disease (NCD) burden in prisons in the WHO European Region

Interventions and policy options

POLICY BRIEF



## ABSTRACT

The aim of this brief is to shed light on the scale of the noncommunicable disease (NCD) burden in prisons and the unique challenges they present for individuals and society both during and following incarceration. The brief also highlights best practices, interventions and policies to address NCDs and their risk factors in the prison context, while also noting special considerations for their implementation in specific contexts and settings.

WHO/EURO:2022-4912-44675-63435

## KEYWORDS

ALCOHOL USE, SMOKING, NUTRITION, EXERCISE, CARDIOVASCULAR HEALTH, NEOPLASMS, EUROPE, HEALTH POLICY, NONCOMMUNICABLE DISEASES, RISK FACTORS, PRISONS

## © World Health Organization 2022

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition: Addressing the noncommunicable disease (NCD) burden in prisons in the WHO European Region: interventions and policy options. Copenhagen: WHO Regional Office for Europe; 2022".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization (<http://www.wipo.int/amc/en/mediation/rules/>).

**Suggested citation.** Addressing the noncommunicable disease (NCD) burden in prisons in the WHO European Region: interventions and policy options. Copenhagen: WHO Regional Office for Europe; 2022. Licence: CC BY-NC-SA 3.0 IGO.

**Cataloguing-in-Publication (CIP) data.** CIP data are available at <http://apps.who.int/iris>.

**Sales, rights and licensing.** To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

**Third-party materials.** If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

**General disclaimers.** The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.

Cover photo: ©UNODC/Maxim Shubovich



**World Health  
Organization**

REGIONAL OFFICE FOR **Europe**

# **Addressing the noncommunicable disease (NCD) burden in prisons in the WHO European Region**

Interventions and policy options

**POLICY BRIEF**



# Contents

Foreword.....	iv
Acknowledgements .....	vi
Abbreviations .....	vii
Executive summary .....	viii
Introduction .....	1
<b>1. Prevalence of noncommunicable diseases (NCDs) in prisons .....</b>	<b>3</b>
<b>2. Profiles of the main NCDs in prisons .....</b>	<b>7</b>
2.1 Cardiovascular disease (CVD).....	8
2.2 Obesity and overweight .....	10
2.3 Cancer.....	12
2.4 Respiratory conditions .....	14
2.5 Mental health.....	16
<b>3. Risk factors for ill health in prison .....</b>	<b>19</b>
<b>4. Approaches and policy options to prevent and reduce the NCD burden in prisons.....</b>	<b>23</b>
4.1 Improving nutritional quality and reducing salt intake .....	25
4.2 Increasing physical activity.....	27
4.3 Reducing alcohol use.....	29
4.4 Reducing tobacco use.....	31
4.5 Halting the rise in diabetes .....	34
4.6 Halting the rise in obesity and overweight.....	35
4.7 Reducing high blood pressure .....	36
4.8 Cervical cancer screening.....	36
4.9 Environmental interventions .....	37
<b>5. Enabling factors and implementation considerations .....</b>	<b>39</b>
5.1 Enabling factors .....	39
5.1.1 Health-care workforce.....	39
5.1.2 Technologies and medicines .....	43
5.1.3 Health surveillance and monitoring .....	44
5.1.4 Continuity of care .....	45
5.2 Implementation principles and considerations .....	48
<b>6. Conclusions .....</b>	<b>51</b>
<b>References.....</b>	<b>53</b>

# Foreword

There are more than 1.5 million people held in detention across the 53 countries of the WHO European Region and over 11 million globally. When a person is deprived of their freedom, governments become accountable for their rights as citizens and are therefore responsible for ensuring access to the highest standard of health care, regardless of a person's race, religion, political belief, economic and social condition, and legal status.

It is estimated that around 30 million people, most of whom experience multiple disadvantages, move globally between prisons and communities each year. The continuous interflow of people between community and custodial settings makes the latter a key focus of public health, as investments made in prison health services decrease the burden on community health care and eventually contribute to healthier societies. Addressing health inequalities in prisons is crucial.

Noncommunicable diseases (NCDs) cause 71% of deaths globally and present a challenge to health-care systems. However, NCDs are poorly recognized as an important health issue in prisons, where the main focus has traditionally been on the prevention of infectious diseases and injuries. There is scarce research into NCDs in prisons or robust surveillance data from prisons. The underinvestment in NCDs witnessed in society at large is magnified in prison settings, where NCDs are still not considered a priority.

WHO's European Programme of Work sets out a vision to better support countries in achieving universal health coverage. One of its flagships is mental health, an important component of prison health. Current information systems in the European Region, however,

poorly capture the full remit of service delivery and health outcomes. Information on behavioural risk factors captured in prison health records is also scarce. Previous data from the Health in Prisons European Database suggested that only 2% of the Region's Member States had data on the proportion of overweight people in prison and only 15% could indicate the prevalence of hypertension – both risk factors for NCDs. This is why WHO believes that it is a priority for prison health systems to focus on full implementation of prison health records. Information systems need to capture high-quality data on NCD risk factors so that evidence-based policies can be adopted.

Since the start of the COVID-19 pandemic, there have been numerous outbreaks in prisons, often as a result of inadequate capacity and inequalities in access to resources. Existing NCDs put those affected at increased risk of serious illness or death. Over 90% of imprisoned people are male, the age profile is rising, and there is an overrepresentation of black and ethnic minority groups. As with NCDs, the most marginalized groups are worst affected by COVID-19. This last year has shown us that many of the tools required to fight a pandemic are those required to fight NCDs.

By launching this report, the WHO Regional Office for Europe expects to contribute to increased awareness of the burden of NCDs in prisons and to demonstrate the need to invest in efficient health information systems that capture data on NCD risk factors and so allow prison health and public health to become fully integrated.



**Dr Hans Henri P. Kluge**  
WHO Regional Director for Europe



# Acknowledgements

This publication was developed by Filipa Alves da Costa, Public Health Specialist, WHO European Office for the Prevention and Control of Noncommunicable Diseases, under the guidance of Carina Ferreira-Borges, Acting Director for Noncommunicable Diseases, Division of Country Health Programmes, and Programme Manager, Alcohol, Illicit Drugs and Prison Health, WHO Regional Office for Europe.

This document received important contributions, in terms of structure and content, from Yanina Andersen, Public Health Specialist, WHO European Office for the Prevention and Control of Noncommunicable Diseases; Sunita Stürup-Toft, Public Health Specialist, Public Health England, United Kingdom; and Emily Wang, Professor, Yale School of Medicine, and Director of SEICHE Center for Health and Justice.

The final document received contributions from Sofia Ribeiro, public health physician; Tammy Boyce, Health Inequalities Specialist; Angela Ciobanu, Technical Officer, Tobacco Control Programme; Romeu Mendes, public health physician; Stephen Whiting, Technical Officer, Physical Activity Programme, WHO European Office for the Prevention and Control of Noncommunicable Diseases; Maria Neufeld, Technical Officer, Alcohol and Illicit Drugs Programme; Marilys Corbex, Senior Technical Officer, Cancer, Division of Country Health Programmes.

The publication was made possible by funding from the Government of Finland.



# Abbreviations

<b>ACA</b>	Affordable Care Act (USA)
<b>COPD</b>	chronic obstructive pulmonary disease
<b>CVD</b>	cardiovascular disease
<b>HIPED</b>	Health in Prisons European Database
<b>NCD</b>	noncommunicable disease
<b>SDG</b>	Sustainable Development Goal

# Executive summary

This report summarizes the existing evidence and presents policies and interventions to reduce the noncommunicable disease (NCD) burden in prisons, providing examples of good practice from across the world. While not exhaustive, these examples are expected to offer simple and well-designed practice-based solutions that will increase physical activity, improve nutritional quality and reduce salt intake, reduce alcohol and tobacco use, halt the rise in diabetes, halt the rise in obesity, reduce high blood pressure, extend cervical screening and improve environmental interventions.

Finally, some enabling factors that should enhance successful implementation are presented; these relate to the health workforce, technologies and medicines, health surveillance and monitoring, and continuity of care.

In accordance with the principle of equitable standards of care, NCD policies in prisons should reflect and align with WHO global approaches to NCDs, while also taking account of the specificities of prison settings with respect to both design and implementation of interventions and policies. Successful achievement of NCD targets in prisons requires that the NCD risk factors that present particular challenges in prisons are addressed.

Key governance principles include the principles of equivalence of care between prison and community, and clinical independence of health-care providers. Clinical independence is important in a context where the principles of free choice of provider may not apply and is considered a critical aspect of high-quality care. Continuity of care and sustainability of interventions are also important aspects of good NCD policies in the criminal justice system. Therapies should be available and free of charge during incarceration, but action is needed to ensure that access to continuous care is sustained following release.

There is scarce high-quality evidence on the prevalence of NCDs in prisons. The existing body of literature suggests that, for most NCDs, there is an excess prevalence in prison.



### Cardiovascular disease (CVD)

Prevalence of CVD in individuals aged over 50 living in prisons in Europe is over **three times higher** than that reported for the general population.



### Obesity and overweight

Overweight and obesity were found to be only **slightly higher** in prison populations, with some inconsistencies across studies. However, various studies suggest that many people gain excess weight while in prison and that weight-related health problems are common in correctional settings.



### Cancer

Most evidence on cancer risk originates from the USA and Canada and suggests that incarcerated individuals have a **4-5 times higher** risk of reporting cervical cancer and a **1.4-1.6 times higher** risk of dying from cancer, particularly of the head and neck, liver, and lung, than people of the same sex and equivalent age living in the outside community.



### Respiratory conditions

The chances of having respiratory conditions, including asthma and chronic obstructive pulmonary disease, have been reported to be **3-6 times higher** in prison compared to the general population.

### Mental health

People in prison have rates of psychotic illnesses and major depression **2-4 times higher**, and rates of antisocial personality disorder **10 times higher**, than the general population.





# Introduction

The burden of noncommunicable diseases (NCDs) presents an enormous challenge for the prison population and system. Studies have shown that several NCD conditions, including cardiovascular disease (CVD) and cancer, are among the most common causes of death in prisons (1,2). This situation is further exacerbated by the poor pre-existing health condition of people living in prisons, who often come from disadvantaged and discriminated groups of society and for whom prison may be their first contact with health services. Additional risk factors such as alcohol consumption, smoking, lack of physical activity and unbalanced nutrition, which are either unique to or amplified in the prison environment, further increase the severity of health outcomes.

Many commitments have been made, at global, regional and country level, to address the overall NCD burden in the general population. The WHO framework action plan outlines a group of targets and indicators to help Member States meet their NCD challenges (3).

Despite the scale of the burden that NCDs impose on prisons and the broader attention that the issue commands in the public health community, it remains largely unaddressed in the prison context. The importance of addressing the problem is clear in the WHO Global Programme of Work (GPW13), which sets the target that by 2023 one billion more people should benefit from universal health coverage – a goal that is only possible if no one is left behind, including those in detention (4).

Principle 9 of the United Nations Basic Principles for the Treatment of Prisoners states that “Prisoners shall have access to the health services available in the country without discrimination on the grounds of their legal situation” (5), an argument that is reinforced in the Moscow Declaration on Prison Health as Part of Public Health, with the notion that governments become accountable for meeting, free of charge, all the health-care needs of people deprived of liberty (6). Equivalence of care is also emphasized by the United Nations Principles of Medical Ethics, which states that health personnel, particularly physicians, charged with the medical care of prisoners and detainees have a duty to provide them with protection of their physical and mental health and treatment of disease of the same quality and standard as is afforded to those who are not imprisoned or detained (7,8). Independence of care from the prison administration is also a crucial aspect of the quality of health care, implying that health-care personnel must have total autonomy in their decisions, which should never be overruled by security issues (9). However, most people do not stay in prison indefinitely and often the period of incarceration is relatively short, particularly in the WHO European Region. Health care delivered to people in detention must therefore be recognized as part of a pathway to and from community health services, as stressed in the Helsinki Conclusions (10).

This brief aims to show the scale of the NCD burden in prisons and the unique challenges it poses in the prison context. It outlines the available evidence on the best practices and policies that have been implemented and claimed to have a positive impact on addressing NCDs and their risk factors in prisons. In addition to presenting possible interventions, the brief includes considerations for implementation in specific contexts and settings.





## Prevalence of NCDs in prisons

The disproportionate burden of NCDs in prisons is well documented. A systematic review and meta-analysis of 28 NCDs from prisons in 11 countries showed pooled prevalence for the most significant NCDs ranging from 8% for cancer to 39% for hypertension (11). Another study, from the United States of America, reported a higher likelihood of several chronic conditions among people living in prisons compared to the general population, including a five times higher chance of cervical cancer and 1.2 times higher chance of hypertension (12). A cohort study in Canadian prisons identified a mean age of death of 48 years; the most common causes of death were cancer and ischaemic heart disease, accounting for 15% and 10% of deaths, respectively (13).

While it has been suggested that the effects of incarceration on some NCDs, such as CVDs, result from pre-existing factors including demographic characteristics, ethnicity and low socioeconomic status, some conditions may be related to the prison environment itself or exacerbated during incarceration. For instance, among people in prisons in the USA with an active medical problem, one study found that 24% of people living in state prisons who were taking prescription medication stopped taking their medication during incarceration and only 6% had undergone required laboratory monitoring (14). This can be attributed to several factors, including the kind of health care provided in prison (where, for instance, clinical independence and equivalence in access to specialized medical care may be lacking); the prison environment (including issues such as unhealthy diets or limited exercise); and limited autonomy to exercise positive health behaviours (such as the ability to manage one's own medication or to have control over exercise opportunities) (2).



An increasing and ageing prison population presents additional challenges to a population that already experiences worse health outcomes. In 2018 there were more than 11 million people living in prison around the world, representing an increase of 8% since 2010 (15). Of these, around 1.5 million were imprisoned in Europe. Because the prison population is growing and changing, increasing numbers of older individuals are more likely to experience NCDs (16). It has also been reported that ageing per se, occurring globally, is playing a role in the age profile of the prison population and, consequently, in disease prevalence. A systematic review focusing on epidemiological data of people in prison highlighted that older individuals had higher rates of diabetes, cancer, CVD and liver disease (17). It is worth noting that, while in industrialized countries and in the WHO European Region people aged 65 and over are conventionally referred to as “elderly”, it has been shown that, for the prison population, a definition of 50 years and over might be more appropriate (14,18). Furthermore, individuals with a history of incarceration have been shown to have higher rates of comorbid alcohol and drug use disorders and mental disorders, compared with the general population, making treatment harder to manage (13). Vulnerability to NCDs is particularly pronounced among certain demographic groups. It has been reported that women with a history of incarceration have a higher risk than men of multiple chronic diseases (19).

The poor health of people living in prisons has direct implications that extend beyond the time actually spent in prison, as care following release is an important aspect of good NCD care. When individuals are released from a correctional facility, their health outcomes are generally worse, compared with people who have never been incarcerated, because they have fewer economic resources, higher levels of stress, competing priorities and poor access to care (18). National studies conducted in the USA prior to the expansion of Medicaid\* under the Affordable Care Act (ACA) show that only 20% of individuals were insured following release from a correctional facility and saw a health-care provider for routine care within a year following release (20). Other publications show that the expansion under the ACA saw a 6% decrease in the proportion of uninsured people among those with no history of incarceration and a 7% decrease among those with a history of incarceration. However, the difference in coverage between these two population subsets (justice-involved individuals and the general population) persisted and remained at around 16%, with the proportion of uninsured among those with a history of incarceration falling from around 40% to 35% following the advent of the ACA, compared with a fall of 25% to 20% among those with no such history (21). Nonetheless, this study also suggests that, even though the gain in coverage was slightly higher for those involved with the criminal justice system, there was no comparable increase in engagement with health-care services. It has been reported that beneficiaries of Medicare\* who have recently

---

\* Medicaid is a state and federal health insurance programme for adults who fall under the federal poverty line; it is the main insurance scheme that would cover most people released from prison. However, it is possible that some individuals may, alternatively or in addition, be covered by Medicare, which is a health insurance that covers people aged 65 and some younger people who have disability status or conditions such as end stage renal disease.

been released from correctional facilities have a higher hospitalization rate from cancer and CVD and an increased risk of mortality in the months following release, compared with the general population (22). Two statewide studies in Washington State and North Carolina and one focused on HIV individuals also found an increased risk of cancer mortality in the year following release among released individuals compared with the general population (12,23). Increased risk of developing hypertension and left ventricular hypertrophy and higher rates of inadequate hypertension management and control have been reported, as well as an increase in all-cause mortality among white men with a history of incarceration (24,25).



# 2

## Profiles of the main NCDs in prisons

In the countries of the WHO European Region, governance of prison health is most commonly held by the Ministry of Justice, sometimes by the Ministry of the Interior, and in a minority of cases by the Ministry of Health. Moreover, even in those countries where the Ministry of Health is involved, prison health information is not integrated with public health. The level of digitalization of health records is variable but tends to be suboptimal. For all these reasons, data and evidence are a challenge in this area, and prevalence estimates often result from ad-hoc academic research studies. Definitions and criteria used for defining populations, diseases and risk factors for ill health differ across studies, limiting comparisons within and across countries.

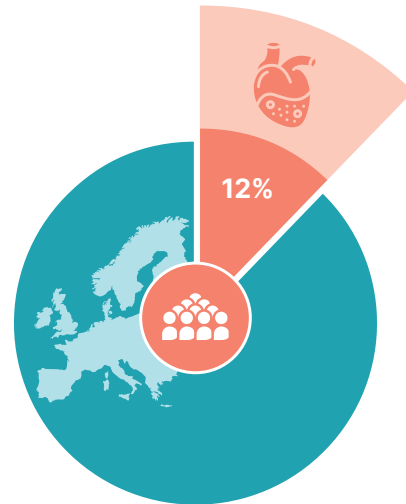
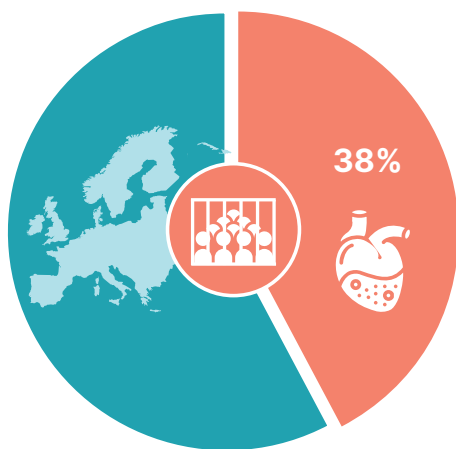
Because the literature on NCDs and their risk factors in the imprisoned population is scarce, for this brief no limits were imposed on date of publication or study type.

While there is a wide range of NCDs, in this section the focus is on five main NCDs, four of which account for almost 70% of deaths worldwide (26). These include CVDs (including heart disease and stroke), cancer, diabetes and respiratory conditions (notably, chronic lung disease). The fifth NCD is mental health, the role of which in achieving global development goals is increasingly acknowledged (27).



## 2.1 CVD

Pooled prevalence among 93 862 individuals aged over 50 living in prisons in 11 countries suggests that 38% present a CVD (11).



In the general population, in 2015 there were over 85 million people living with CVD (equivalent to around 12% of the European population)(28).

**CVD is one of the leading causes of death among incarcerated individuals (29),** and those recently released have a higher risk of dying from CVD compared to the general population (2).

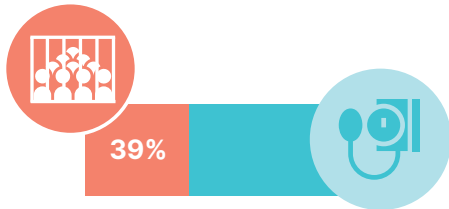


**People in prison have higher rates of CVD risk factors,** especially hypertension and smoking, compared with demographically matched individuals living in the community (2,30).

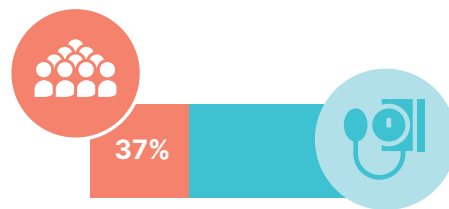
**Low socioeconomic status is a known predictor of poor cardiovascular health,** often related to engagement in unhealthy lifestyles such as frequent fast-food consumption – habits that may persist during incarceration in countries where such options exist in prison facilities.







It has been estimated that 39% of the prison population present with hypertension (11).



In the general population, age-standardized prevalence of hypertension in 2019 reported for the WHO European Region was 37% (31).

Among females living in Brazilian prisons the reported prevalence of hypertension is 38% (32).

An existing cohort in the USA – Coronary Artery Risk Development in Young Adults (CARDIA), developed to explore the links between imprisonment and cardiovascular health – showed that former inmates had a **1.7 times higher** risk of having hypertension, even after adjusting for known risk factors, such as smoking, alcohol and illicit drug use, and family income (24).

Other estimates indicate hypertension may range between 10% and 30% (2,23,33). Nonetheless (in this case, based on the USA only), this value is around 1.7 times higher than that reported for the general population. Most of the prison population is male and most studies therefore present estimates for males.

Similar findings were reported by others, also in the USA, who found that the likelihood of developing hypertension was **1.2 times higher** among people living in prison (12).

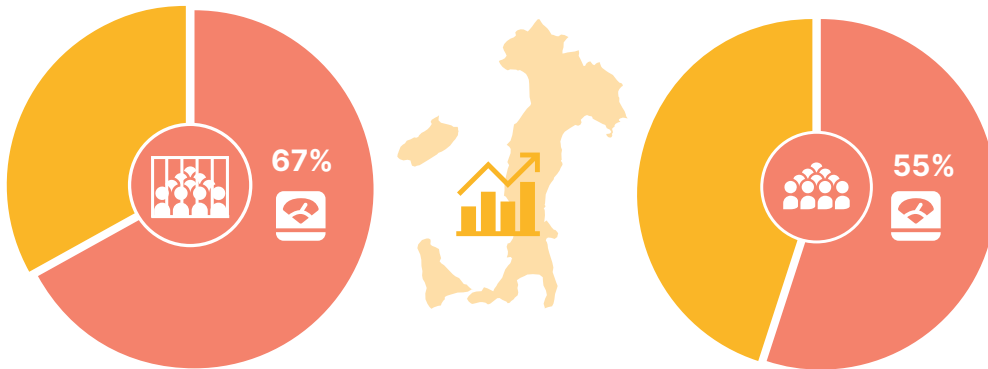
Ethnicity is associated with hypertension. Black populations have an earlier onset compared to white populations, both in prison and in the community (34). There is also evidence that rates of incarceration are higher among black populations (35). Thus it is expected that the excess proportion of black people in prison contributes to the excess prevalence of hypertension in prison.

In 2014 diabetes remained one of the main CVD risk factors in Africa (36). While the estimated prevalence of diabetes for the region in 2011 was 4% (37), evidence suggests that the prevalence of diabetes in people living in prison in Africa was more than twice as high (9%) (38). These data suggest that ethnicity has a role in addition to inequalities.



## 2.2 Obesity and overweight

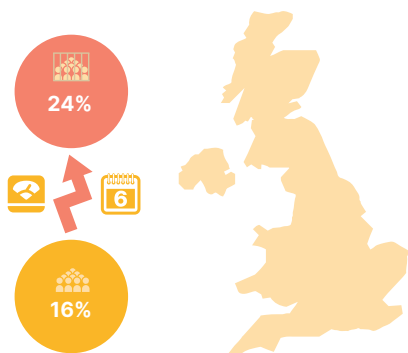
In Italy the prevalence of obesity and overweight among people in detention (67%) was found to be higher than in the general population (55%) (39).



US-based studies point to higher values, with obesity (including severe obesity) and overweight comprising 74% of the prison population (2).

Similar values were reported in other studies that related exclusively to women (70%), although in the USA they did not differ from those found in the general population (40).

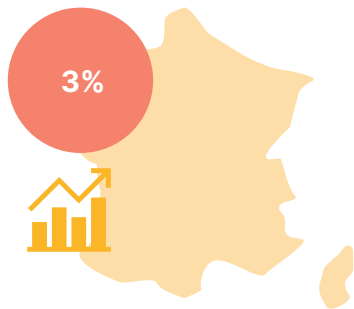
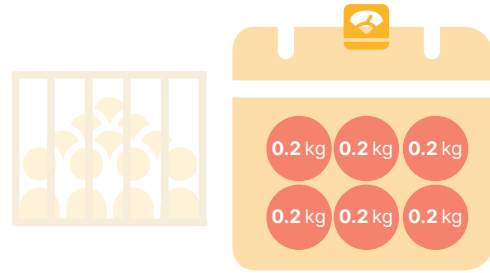
A systematic review covering 24 311 males aged between 16 and 81 living in prison suggested that the prevalence of obesity was between 8% and 56% (41). This variability may be explained by the origin of the primary studies (most were from developed countries), the reporting methods used (many used self-reported data), the varied sample sizes, and the time of measurement with respect to length of incarceration.



Evidence from the United Kingdom points to a prevalence of obesity at admission of 16%, rising to 24% six months after incarceration (42).



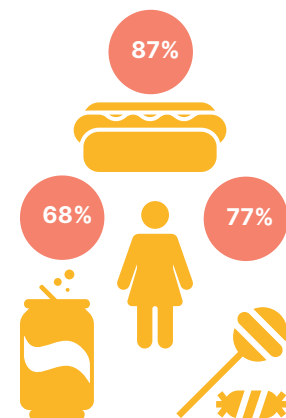
Data from a systematic review including 11 studies reported an average weight gain of 0.2 kg (0.43 lb) per week following incarceration (43).



Comparing obesity at admission and during incarceration, a French study found an increase in prevalence of 3%, suggesting the negative impact of incarceration. This study, albeit small, also suggested that females are more prone to exhibit abdominal obesity, to have low physical activity and to be diagnosed with eating disorders (44).

Existing knowledge suggests that many people gain excessive weight while in prison and that weight-related health problems are common in correctional settings (45).

Eating disorders are highly prevalent in women living in prison in high-income countries; these may lead to them having overweight and obesity or underweight, thereby undermining physical and mental health (45). A study in a female prison showed a very high prevalence of daily consumption of ultra-processed foods, including hot-dog bread (87%), sweetened beverages (68%) and sweets/candies (77%) (46).

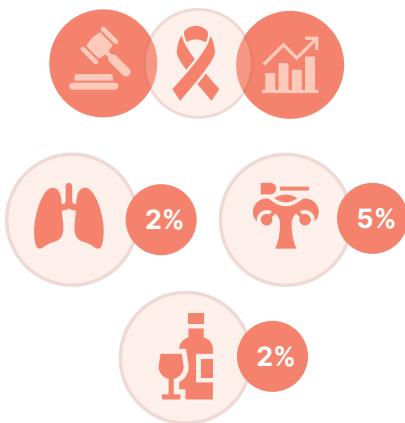
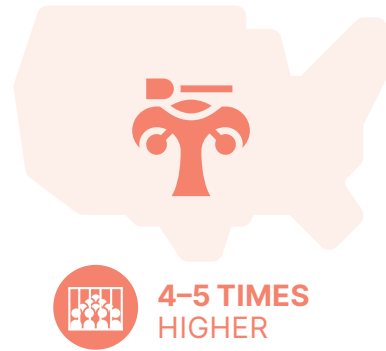


Evidence from 2006 suggested that nutritional practices among people living in prisons were poor, with frequent low fruit and vegetable consumption. However, such data also suggested that, even when people in prison were given the opportunity to access a healthy diet, they often chose not to, indicating that the design of interventions needed to be improved (47).



## 2.3 Cancer

Individuals incarcerated in US jails and prisons have higher rates of cancer compared with the general population (12). Estimates suggest that the risk of reporting cervical cancer in jails and prisons may be 4–5 times higher (12).



A study focusing on prevalence of cancers that are substance use-related (related to smoking or alcohol use) and can be detected with guideline-based screening (lung, cervical, colon, breast, prostate) used 10 years of data from the US National Survey on Drug Use and Health; compared with individuals without criminal justice involvement, it was found that those with criminal justice involvement had a 2% higher age-adjusted prevalence of lung cancer; a 5% higher prevalence of cervical cancer; and a 2% higher prevalence of alcohol-related cancer (48).

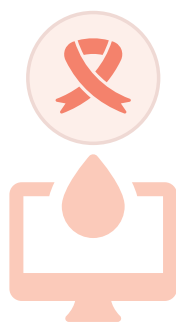
Furthermore, people in prison in Ontario, Canada, were reported to have a **1.4–1.6 times higher** risk of dying from cancer, particularly head and neck, liver and lung, than people of the same sex and equivalent age living in the community (49). Higher cancer mortality among those living in US jails and prisons had previously been reported, with 31% of prison deaths in 2013 being cancer-related (29).

There are a number of possible reasons why cancer mortality may be associated with incarceration. Individuals with a history of incarceration more commonly display cancer risk factors such as smoking and alcohol use (48), and present with infectious diseases, including HIV and hepatitis C (50–52).



Evidence shows that, in the USA, incarcerated patients present at a later stage for all cancer types compared with the nonincarcerated population. In particular, later stages of diagnosis were identified for colorectal, oropharyngeal, lung and skin cancers and screenable cancers (colorectal, prostate, lung) as a whole (53).<sup>53</sup>

Another study, from Canada, focusing on screening for cervical cancer, reported that women experiencing imprisonment were less likely to be up to date with screening. The study reported that 54% of women in prison were overdue for screening, compared to 33% in the general population (20).



While screening and treatment for cancer may be constitutionally guaranteed in correctional facilities in some countries, access to good-quality services may be worse for individuals in correctional facilities than in the community. Screening is the only cost-effective intervention – it should be recommended to all countries of the WHO European Region and prisons should not be excluded.

If cancer is not diagnosed at early stages in those living in prison, there will be worse treatment outcomes.



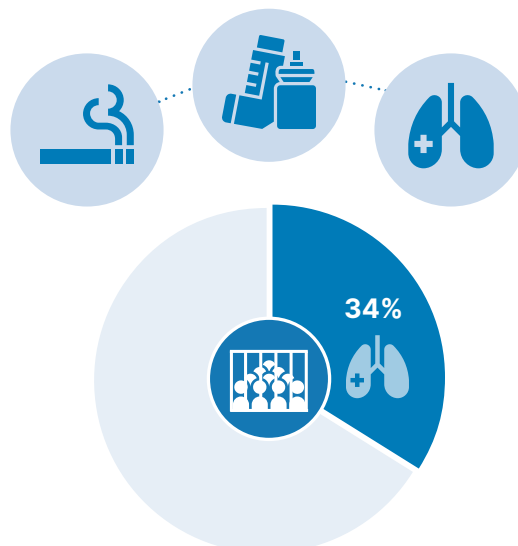


## 2.4 Respiratory conditions

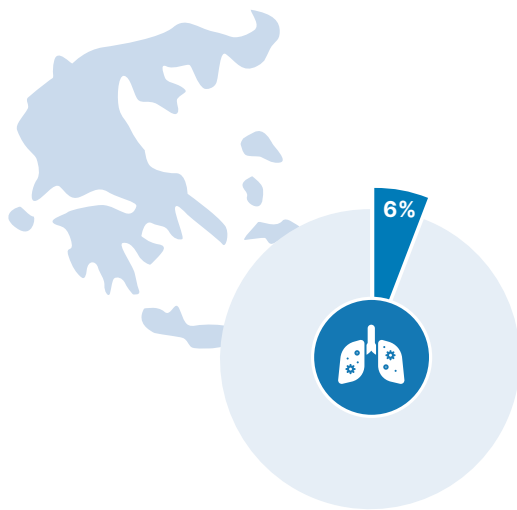
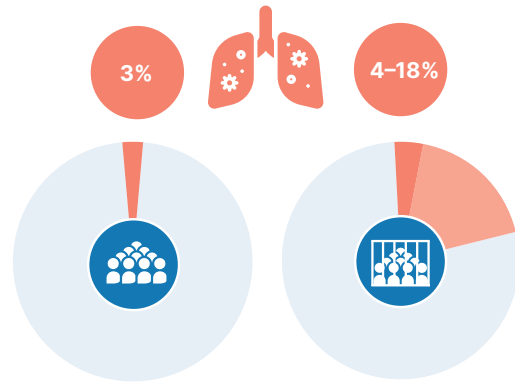
Incarcerated individuals have been reported to have a higher chance of respiratory conditions, including asthma (12). In one study, respiratory disease was the second most common self-reported condition in prison, reported by 17% of individuals assessed (23). In the general population, asthma prevalence was estimated to be around 5% in 2015 (54).



One study looking at individuals newly admitted to a maximum-security jail reported that respiratory conditions were the most frequently encountered, with a value as high as 34%. This study confirmed that smoking habits were frequently associated with asthma (55).



Chronic obstructive pulmonary disease (COPD) in those aged over 50 has been reported as ranging from 4% to 18% in prison (11), compared to 3% found in the general population (20).



A field study in Greece reported COPD to be present among 6% of inmates, increasing with age and length of sentence. Not surprisingly, this same study also showed that 79% of these individuals had marked smoking habits with intense associated nicotine dependence (57).

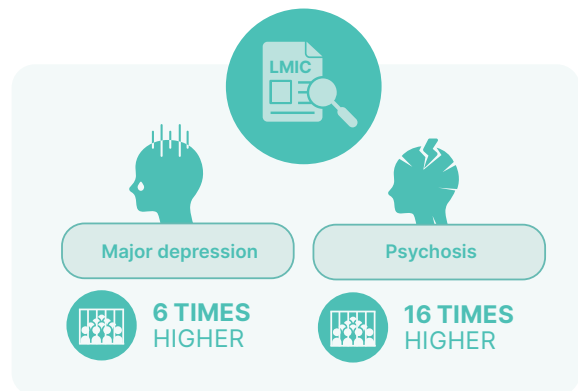


## 2.5 Mental health

Mental health is a public health challenge in prisons across the world. People in prison have rates of psychotic illnesses and major depression two to four times higher than the general population, and rates of antisocial personality disorder about 10 times higher (58).

A recent systematic review involving over 14 500 people in prison from low- and middle-income countries suggested a prevalence of 6.2% for psychosis and 16% for major depression. Compared to the general population, these values are up to 16 times higher for psychosis and up to six times higher for major depression (59).

### Psychotic illness and major depression



A study involving over 1000 females living in prison, assessing mental health through a standardized questionnaire, reported a prevalence of common mental disorders of 67%. This study suggested that such disorders were associated with lack of income, physical inactivity and psychological violence (60).

A meta-analysis conducted in the general population estimated the lifetime prevalence of common mental health disorders to be 29% (61). Estimates should be interpreted cautiously and comparisons across studies limited not only by settings but also by the methods and tools used to assess mental health and by the classifications used (for example, types of depression and self-reported versus clinical).



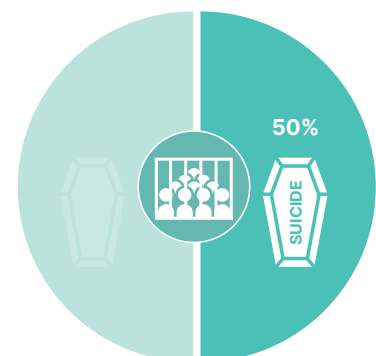
Women have been reported to be more likely than men to have a preliminary diagnosis of mood disorders in prisons (62). A study conducted to investigate mental health disorders among women living in prisons found a much higher likelihood of a diagnosis, with 84% of women meeting the criteria for a mental health disorder; the most common were drug use disorder (57%), major depression (44%) and post-traumatic stress disorder (36%) (63).

Another study, of women in the Canadian prison system, reported that substance use disorders (91%) and affective disorders (42%) were the most prevalent mental health diagnoses, which in most cases co-occurred (64).

A study undertaken among older females in prison suggested that there were high numbers of mental health conditions, including depression and anxiety. Half of these women reported a history of sexual or physical abuse, with many cases leading to serious trauma and physical injuries (65).

Mental health problems, particularly anxiety, depression and suicidal desire, were also commonly found among older people in prison (17).

As a result of all these issues, suicide accounts for 50% of all prison deaths (66). Suicide rates have also been shown to vary markedly according to sex, similar to the pattern observed in the outside community but with a considerably higher imbalance. Suicide was reported to be three times higher in males living in prisons and nine times higher in females living in prisons, when compared to the general population (67).







# 3

## Risk factors for ill health in prison

For several decades WHO has focused its attention on four major risk factors that are shared by most NCDs, including tobacco and alcohol use, low levels of physical activity and unbalanced diet. More recently, environmental pollution and other environmental risks have been highlighted as a cause of concern, as they are estimated to be currently responsible for nearly a quarter of deaths (68). In addition, there are other risk factors that are typically applicable to certain NCDs, as is the case with drug use, which has a particular impact on mental health and behaviour. The overlap and interplay between multiple risk factors are common, suggesting that interventions should target multiple risk factors in order to affect multiple NCDs simultaneously (68). A graphic representation of the major risk factors in prisons and other places of detention is presented in Fig. 1.

**Fig. 1.** The five major NCD risk factors that are most significant in prisons and other places of detention









# 4

## Approaches and policy options to prevent and reduce the NCD burden in prisons

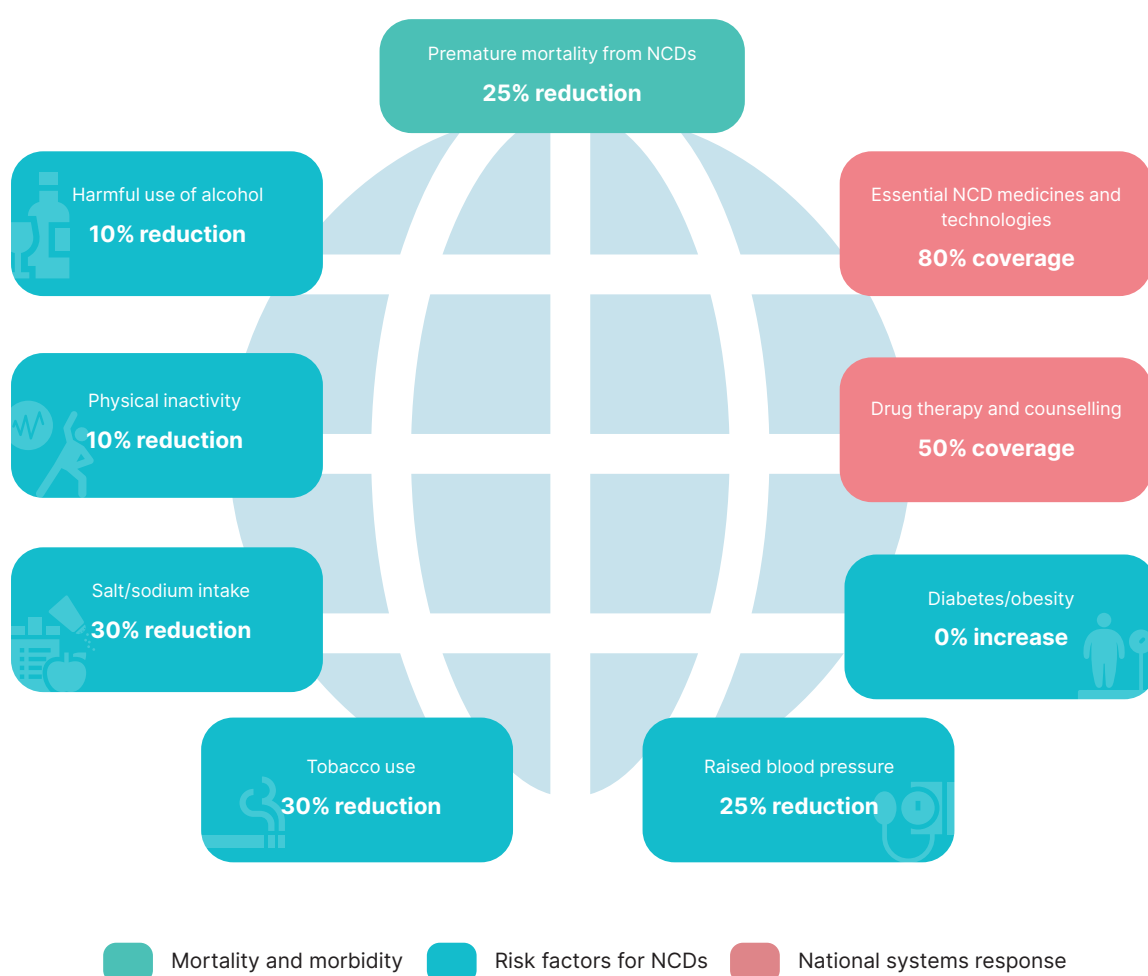
Global efforts to reduce NCDs are guided by the WHO Global Monitoring Framework, which gives direction to Member States so that they can align their national responses around core areas and specific indicators and targets to measure progress in each indicator (Fig. 2) (75).

In accordance with the principle of equivalence, NCD policy options in prisons should align with the global approaches to NCDs while taking account of the specificities of the prison setting, both in regard to the design of interventions and policies and to their implementation. Successful achievement of the above-noted NCD targets in prisons involves addressing the NCD risk factors that, while shared with the general population, present unique challenges in prisons.

Interventions to prevent and manage NCDs in prison aim to tackle behavioural risk factors, such as nutrition and physical activity, alcohol and tobacco use. However, interventions must also consider access to treatment, which may be focused on control of underlying conditions, such as hypertension and diabetes, or access to pharmacological interventions and other technologies necessary for secondary prevention of NCDs.

Fig. 2 presents nine voluntary targets set by the Global Monitoring Framework to be met by 2025 (75). Six of these targets are subsequently described in detail in sections 4.1–4.7 below; the two targets coloured pink are discussed in section 5.1.2. Premature mortality from NCDs is a key overarching target, although one that is not fully elaborated for the prison context given the scarcity of high-quality data. These targets have been set for the general community and are not specifically tailored to the needs of the prison population. However, all available evidence indicates that targets set for prisons should be equivalent to or exceed those set for the general population.

**Fig. 2. Nine voluntary targets set for 2025 in the Global Monitoring Framework**







## 4.1 Improving nutritional quality and reducing salt intake

### **WHO target: 30% reduction (of salt intake)**

Supporting good nutritional habits by promoting consumption of fruits and vegetables, while limiting intake of salt, free sugars and certain types of fat, can enhance the quality of life of people living in prisons and prevent various NCDs.

Prison food systems include food service catering programmes, self-cook facilities, prison shops or canteens, food shared with visitors, vegetable gardens and informal preparation of food in housing units (45). According to data from a survey undertaken by the WHO Regional Office for Europe, 97% of 37 countries reporting data stated that meals were prepared in centralized kitchens, while 33% stated that self-cook kitchens were available (76). Innovative ways of promoting good eating behaviours, such as the Danish self-catering model, have also been described (Box 1). Other innovative methods include nutritional education, gardening, inclusion of healthy choices in the prison shop inventory and culinary training (45).

### **Box 1. The Danish prison self-catering model (77)**

The Danish self-catering model incorporates several key components, including normalizing preparation and consumption of meals, to ensure closer alignment with the community way of living. Initially launched in 1976, and since then expanded to a nationwide programme, its key objectives include equipping people with the necessary skills to maintain a healthy lifestyle during and beyond their sentence. Around 65% of Danish people living in prison are involved in the self-catering model.

In the absence of cafeterias in Danish prisons, the key activities of this model include purchasing of ingredients in the prison grocery store, preparation of one's own food in self-catering kitchens and cleaning. A weekly allowance of €67 is paid for groceries and cleaning supplies. In-cell refrigerators are available to store ingredients purchased.

Although initially conceived as a way to address nutritional problems in prisons, it is now also perceived as an interdisciplinary initiative to address health and criminal justice issues to ensure successful transition post release to reduce the risk of reoffending. Denmark's reoffending rate, at 29%, is currently one of the lowest in Europe.

A study evaluating the introduction of a nutritional programme in a Spanish prison found that there were diet modifications in the vast majority of people, with notable reductions in weight and blood pressure, leading to a lower CVD risk (78).

The quality and variety of food in prisons depend not only on policy options taken to promote the adoption of healthy lifestyles but also on the daily food allowance set by prison administrations, which obviously varies between and within countries (47).



## 4.2 Increasing physical activity

### **WHO target: 10% reduction in physical inactivity by 2025 and 15% by 2030 (79)**

The Nelson Mandela Rules refer to giving all people living in prison opportunities for sport and exercise with at least one hour per day of outdoor physical activity, preferably with technical supervision (80). However, prison regimes have been identified as a potential barrier to implementing changes in dietary or physical activity behaviour. In some countries the prison regime itself may limit the potential for behaviour change – for instance, there may be limited access to prison physical activity infrastructures or limited options on prison menus. In the United Kingdom, it was reported that 43% of people living in prisons participated in some form of organized physical education activities, although wide variations within the country were acknowledged, some of them resulting from the conditions offered by facilities, such as the availability of a gym or the existence of enough correctional staff to monitor such activities (47). Other studies suggest that activity levels can vary widely between countries; for instance, in Australia prison was identified as an environment with an increased level of physical activity, while in the United Kingdom it was associated with a decreased level of activity (72). Various initiatives and good practices have been introduced in different countries to encourage people living in prisons to adopt a healthier attitude to physical activity (Box 2).

## Box 2. Physical activity – good practice examples

In Spain a football programme was implemented in 21 prisons by the Real Madrid Foundation's Social Sports Programme (81). Participants reported that the programme had a positive effect on their life in prison and might encourage them to continue playing sport after release.

In Australia a popular community-based running programme – parkrun – has been introduced in prisons (82). People living in prisons volunteer to organize and run the event for other detainees and staff, whose family and friends can also be invited. As a weekly activity, parkrun has been described as a good example of a strong rehabilitative programme, and participants report a positive influence on their diet and other lifestyle choices.

There is a lack of literature examining the effects of increased physical activity in prison settings. One programme designed and led by women living in prisons resulted in reduction of weight, body mass index and waist-hip ratio, alongside improved energy, sleep and stress levels; other reported benefits included “having fun” (83). A systematic review of prison-based exercise training programmes found that 10 out of the 11 studies identified reported significant changes in physical and mental health-related variables (84). Such examples support the idea that, if people living in prisons are given the opportunity to increase their physical activity, there will generally be short- and long-term benefits, affecting their life choices both in prison and following release. Therefore, the interventions that are developed will need to help people in prison to consider both immediate changes that are feasible in the current prison setting and longer-term changes that may be sustained upon release from prison.



## 4.3 Reducing alcohol use

### **WHO target: 10% reduction in the harmful use of alcohol**

Harmful use of alcohol was introduced as a concept in the process of developing the WHO global strategy on alcohol, with the intention of defining the scope and targets for public health interventions; it is broadly defined as drinking that causes detrimental health and social consequences for the drinker, the people around the drinker and society at large. A 10% reduction target in the harmful use of alcohol has been included in the global voluntary reduction targets and in various national action plans. However, with evolving evidence that any alcohol poses a health risk – from the first drink – the concept of harmful use is increasingly being questioned.

Availability of alcohol in prison is regulated in most countries. This includes the regulation of alcoholic beverages coming into prisons, including via visitors and staff, and explicit bans on the production of unrecorded alcohol inside prisons. In the prison context, unrecorded alcohol mainly denotes homemade alcohol brewed by inmates, often under unsanitary conditions; it also includes alcohol-based products not intended for human consumption, such as hand sanitizer and mouthwash. Ingestion of these unrecorded products is particularly risky because they often contain high levels of ethanol, far exceeding the typical alcohol content of alcoholic beverages, which can result in deep intoxication and potentially death. The increased demand for hand sanitizers during the COVID-19 pandemic poses additional challenges since many prisons restrict access to alcohol-based hand sanitizer (85). Although official data are very limited, evidence suggests that about half of all the alcohol seized in prisons is unrecorded, and in some countries there was an increase in seizures of homemade alcohol in prisons during COVID-19 lockdowns (86).

WHO has issued guidance stating that the prison setting is an opportunity to detect and treat individuals who have alcohol use disorders, which may or may not be linked directly to their offences; this is especially important because these individuals are often, in other situations, labelled “hard to reach” (87).

A systematic review focusing on interventions during imprisonment identified some studies where motivational interviewing had a positive impact on people with alcohol use disorders (88–90). Therapeutic communities have been recognized for reducing recidivism, lowering substance use in prison and, to a lesser extent, after release (91–92). An innovative programme to reduce recidivism in New Zealand prisons has been reported (Box 3). There are, however, reports suggesting that few people receive treatment for drug or alcohol use disorders while in prison and that opportunities for prison-based intervention are often missed (93,94).

### **Box 3. New Zealand programme for alcohol dependence (95)**

In New Zealand an innovative programme for alcohol dependence has been developed, involving local staff from Public Prisons, Psychological Services and the Community Probation Service. Its main aim is to reduce recidivism, which is achieved by focusing on recognition of thoughts, emotions and behaviours present before and during criminal activity, particularly when precipitated by alcohol use. This is then accompanied by learning of specific coping skills and intensive lifestyle and reintegration planning. An obvious component of the programme is its continuity following discharge, by liaising with community services.

Nevertheless, for problems to be tackled, the first step is to recognize them. Evidence suggests that there is a lack of standardized measures and methods for screening alcohol use in prison (76). More emphasis should therefore be put on the implementation of national standards for screening, including implementation of screening and brief interventions for alcohol use disorders, as well as continuation of care and treatment following release (92,96).





## 4.4 Reducing tobacco use

### **WHO target: 30% reduction**

Several smoking cessation interventions that have proved effective in the general population have successfully been used in prisons. Cessation programmes in prisons, including both pharmacological and nonpharmacological interventions, were found to lead to a reduction in the number of cigarettes smoked per day and an increase in the probability of quitting smoking while in prison and of abstinence post release (97). Another systematic review reported that cessation rates were comparable in prisons and in the community, where strategies employed included a mix of brief behavioural and cognitive advice sessions, pharmacotherapy and financial incentives (98).

Evidence-based interventions that are effective in the general population can also be effective in prison and their effects seem to persist over time even following release (99). However, if access is not equitable, such interventions can worsen inequalities. In some prisons access to nicotine-replacement therapies may be limited or not free of charge; unsuccessful smoking cessation programmes in detention settings have been attributed to the high costs of these therapies (100). Policy attention needs to focus on supporting people who formerly lived in prisons to access subsidized smoking cessation pharmacotherapy (101). When these therapies are available and free of charge, they help to ensure that equivalent care is available upon release and that continued care is sustained.

In many countries in the WHO European Region legislation banning smoking in public spaces has been extended to prisons; prison systems are well placed to support the public health gains inherent in such legislative initiatives (Box 4). Many individuals stop smoking as a result of entering a smokefree prison, and many European countries now adopt such policies (102). However, it has been stressed that, for such legislative changes to be effective, early dialogue between all stakeholders is needed, and whenever there are concerns – on the part of people living in prisons, staff or both – specific measures must be adopted to address them (103). Smoking bans are not effective in places where such measures are not applied, and therefore ex-smokers, following release, should be

supported by evidence-based smoking cessation interventions to maximize the chances of a sustained effect (99). The same principle applies to forced abstinence observed during incarceration, which may be effective in the short term, but such initiatives must be supported by evidence-based smoking cessation interventions if long-term benefits are to be fully achieved (104).

#### **Box 4. Smokefree prisons in Scotland and the USA**

In 2018 all prisons in Scotland became smokefree. The approach taken was implemented in three phases to ensure that the views of those living and working in prisons were taken into account for successful implementation. Ahead of implementation, there were considerable fears of disorder, which decreased over time. During implementation, support provided included making e-cigarettes available, initially as a risk-reduction strategy, followed by smoking cessation services. There was a reduction of over 90% in exposure to secondhand smoke, showing the impact also on nonsmokers (105–108).

A reduction of 9% in smoking-related deaths was also seen in prisons implementing smoking bans in the USA (109).

In some countries there are no interventions to reduce or ban smoking in prisons; people admitted to prison may even increase their tobacco use and dependence, which suggests that prisons present a unique opportunity to intervene. Other countries may allow smoking in prisons but have invested in creating smokefree cells. However, there is evidence that partial bans cannot prevent exposure to secondhand smoke because tobacco smoke moves easily from smoking to nonsmoking areas in the same building. Data from the Health in Prisons European Database (HIPED) survey (2019) showed that 78% of 32 countries reported that they had made smokefree cells available (76).

The goals and strategies adopted by health-care providers in prisons need to be slightly adapted according to the environment and legal context (Box 5).

For prisons where smoking is not permitted, goal-setting should be based on:

- supporting long-lasting abstinence beyond prison release; and
- helping people living in prisons to understand that e-cigarettes do not help them to give up, that these products are harmful to health and are not safe, and that those who wish to quit tobacco should use available evidence-based cessation methods (110).<sup>110</sup>

### Box 5. Use of tobacco cessation models in prison settings

Primary care providers can apply different strategies to help a tobacco user with an intervention that takes just 3–5 minutes. These include the **5As model** (Ask, Advise, Assess, Assist, Arrange), which can easily be applied in prison settings. After release, ex-tobacco users can access the available cessation services and, with professional support, will double their chances of quitting successfully. For people in prisons that are smokefree, an adaptation of this model, known as the **3As model** (Ask, Assist, Arrange), can be used upon release.

While many individuals seek to quit during their time in prison, there is evidence that, for others, smoking behaviour becomes more entrenched – possibly as a result of their mental health status deteriorating because of deprivation of liberty. For such individuals, the **5Rs model** (Relevance, Risks, Rewards, Roadblocks, Repetition) can help enhance motivation to quit.

Brief tobacco interventions (such as a short consultation using the 5As model) should be supported with intensive interventions and/or pharmacotherapy.



## 4.5 Halting the rise in diabetes

### **WHO target: 0% increase**

There are reports of ad-hoc interventions developed in prisons aimed at reducing diabetes. One such initiative was the Healthy Food Access Project, developed in Oregon, USA, which aimed to provide education on nutrition to women living in prisons and to encourage nutritional changes. The daily menu was reduced by 800 calories, from 3000 to 2200, and a modest improvement in glycaemic control was achieved (111). Mixed approaches, including theory- and practice-based sessions focusing on dietary recommendations, Mediterranean diet and exercise, have also proved to be effective in changing lifestyles (112). Both these reports describe interventions that targeted improved nutrition (see section 4.1) but were specifically developed for people with diabetes or with the aim of preventing diabetes.

Interventions to increase physical activity (see section 4.2) have also produced beneficial results in glycaemic control in people with pre-diabetes (113). Other reported interventions include a scheme in which a collaborative practice agreement was set up through which clinical pharmacists and physicians intervened in a timely manner to optimize medication management, thereby reducing HbA1c (glycated haemoglobin) by 2.3% (114). Use of telemedicine has also been found to lead to improved control of glycaemia, blood pressure and lipids in people in prisons living with diabetes (115).

One key aspect to consider when developing interventions for people in prison is that, in many situations and settings, people may have limited (or no) options. They may be extremely motivated to fully adhere to their medication, but in the prison context they are not given the opportunity to manage their insulin or even antidiabetic medication.



## 4.6 Halting the rise in obesity and overweight

### **WHO target: 0% increase**

Programmes aimed primarily at preventing and reducing obesity and overweight in prisons often include a mix of nutritional and exercise-based interventions (see sections 4.1 and 4.2). Even though they may share general features with interventions designed to tackle diabetes (section 4.5), these programmes are developed primarily to target obesity (116). One study reported an intervention developed in a female prison that used a pedometer and a portion controls tool to supplement education and demonstrated a significant reduction in body mass index after 12 weeks (117).

Exploratory studies focusing on the perceptions of people in prison suggest that there may be particular challenges when tackling obesity in such settings. These include not only individual motivation (for example, when about to return to their families, motivation to eat nutritious foods seems to increase), but also structural challenges, including barriers to exercise (such as limited space and options for exercise), nutrition (for example, having too much bread and insufficient vegetables available), food access (restricted timing of meals) and mental health (incarceration may be a particularly stressful period and food is sometimes described as a substitute for other harmful substances people are deprived of) (118).

As highlighted in the previous section, people in prison may have limited (or no) options for behaviour change. They may be extremely motivated to lose weight by exercising, but if they are not offered a facility or space to do so, behaviour change is unlikely.



## 4.7 Reducing high blood pressure

### **WHO target: 25% reduction**

The development of comprehensive lifestyle interventions within correctional settings is needed and likely to have an impact on cardiovascular health and other NCDs (119).

A systematic review identified 11 possible interventions aimed at improving cardiovascular health. These could fit into one of four categories: structured physical activity interventions; nutritional interventions, and reduction of salt intake in particular; smoking cessation interventions; and combinations of the former. Such interventions seem to favour at least one of the short-term outcomes measured, which included body mass index, quit rates and systolic blood pressure (120).



## 4.8 Cervical cancer screening

Women in prisons are at higher risk of cervical cancer than the general population as a result of specific risk factors (tobacco, early sex with multiple partners) and missed screening. Cervical cancer screening is a cheap and very effective intervention. Cancer of the cervix is preceded by precancerous lesions that take years to develop before becoming malignant (unless women are HIV-positive, in which case the cancer can develop more rapidly). WHO recommends screening from age 30, to be repeated regularly until age 49, the minimum being to be screened twice in life at ages 35 and 45. For women with HIV, it is advised to begin screening at age 25 (121).





## 4.9 Environmental interventions

Correctional settings present unique characteristics, including the fact that people held in custody often have limited or no options. The environment where they live is therefore crucial in determining their behaviours. There are interventions that target environmental factors, such as violence and other forms of abuse, and others that focus specifically on suicide prevention. Transitions into and out of prison represent moments when the right to exercise options radically changes, with an enormous impact on substance use and on mental health.

Guidelines on suicide prevention comprise early identification, treatment and care of people with mental and substance use disorders, chronic pain and acute emotional distress. There is a widespread view that suicides are a direct consequence of poor mental health, but suicide may also result from acute crisis emerging from stress, trauma or even chronic pain. One important component of any of these interventions is training of nonspecialized health workers in the assessment, identification and management of suicidal behaviour, or referral to specialized care when necessary (122).

There is also harm resulting from medication (and other) errors and unintentional injuries that are caused by inefficient systems (or a lack of any system).

Environmental interventions also include provision of access to fresh air, adequate ventilation and lighting, and (ideally) access to green spaces. Given the limited options available to people deprived of their liberty, the focus should be on ensuring that these fundamental rights are addressed, as the impact on the physical and mental health of people who are deprived of them is well documented.







# 5

## Enabling factors and implementation considerations

The prison health system encompasses a very wide array of different elements, or building blocks. These elements, including (among others) governance, financing and the health workforce, are critical in enabling implementation of policies and, most importantly, their sustainability (123). There are a number of key enabling factors that underlie successful NCD interventions in prisons; these factors also highlight the challenges to implementation that may arise as a result of structural, contextual or other factors.



### 5.1 Enabling factors

#### 5.1.1 Health-care workforce

The principle of equivalence that is applied to many aspects of the prison health context implies that Member States need to ensure that the same standards of health service and care are applied in prisons as among the general population. With respect to the prison health workforce, it has been noted that it should be subject to the same standards

of training and professional development as in the community (124). Indeed, several countries in the WHO European Region make explicit reference to the equivalence of competencies of prison health staff (124). As an example, the extensive range of skills and competencies expected of nurses in Spanish prisons is shown in Box 6.

### **Box 6. Training of nurses in Spanish prisons**

In Spain a clear list of nursing competencies developed specifically for prisons is available. This list suggests that nurses working in detention settings should undertake the necessary training and career development pathways to become competent in:

1. being aware of and applying the principles upon which comprehensive correctional nursing care is based;
2. identifying the most prevalent health issues among inmate patients in the correctional setting;
3. being aware of the range of health programmes implemented in the correctional setting;
4. providing nursing care by granting the right to dignity, privacy, intimacy and confidentiality as well as the right of inmate patients to take their own decisions;
5. personalized nursing care according to age, gender, ethnicity, religion and values;
6. designing and implementing individual and group health education programmes according to the health condition of inmate patients, their level of knowledge and the duration of their sentence;
7. being familiar with the specific language (prison slang) used by inmates as a tool to establish an improved communication between nursing professionals and inmates;
8. identifying the range of health demands of inmate patients as a purpose of health, regimental or personal welfare;
9. being aware of extreme situations that entail very specific nursing care;

**Box 6 (contd)**

10. knowing the role of nurses in emergency and vital situations in correctional facilities;
11. knowing external reference health resources that support prison health care;
12. skills to identify physical and/or mental burnout symptoms among correctional nurses to prevent stress and demotivation;
13. the ability to discuss, assess, interpret and critically review the range of information and data sources that enable the provision of care to inmate patients;
14. the ability to work within an ethical professional context with legal regulatory codes, being aware of and responding to ethical or moral dilemmas in everyday practice; and
15. leadership and nursing management skills to lead interprofessional cooperation with other members of the health-care, security and treatment teams.

*Source:* Nursing Department, General Directorate of Prison Health and Rehabilitation<sup>125</sup>

While equivalence in education may be endorsed at the policy level, available evidence indicates that there are substantial gaps in the level of education and training of the prison health workforce, including in critical areas such as substance abuse, mental health, suicide and response to medical emergencies, among others (126).

Lack of professionalization and career development pathways have also been cited as major barriers to developing and recruiting qualified prison health staff (127). Overall, across the WHO European Region, there are significant discrepancies in the health outcomes of the prison population, particularly in the case of infectious diseases, suggesting likely variations in the existence of training standards and quality of the health workforce (76).

In addition to qualifications, the availability of an adequate health workforce in prisons is a key prerequisite to ensure proper prevention and management of NCDs. Data from the HIPED survey (2021) suggest that in some European countries the ratio of health-care professionals per 100 people can be 3.6 lower for prisons than for the general population (128). WHO recommends that all individuals should undergo medication reconciliation on entry to prison (87). However, this assumes the existence of a pharmacist in prison. Data from the previous HIPED survey (2019) indicated that roughly 28% of countries had a pharmacist in all prisons. There are published studies suggesting that there is limited availability of other health-care professionals in correctional facilities (129). Shortages of psychiatrists and psychologists in prisons are documented, limiting the capacity to provide psychological support for mental health disorders (130). A shortage of nursing staff has also been reported in prisons and associated with high levels of moral distress (131). Concerns about the necessary resources and support for effective implementation of smoking bans have also been reported (103).

Having a competent workforce is crucial to encourage behaviour change. If all primary care providers routinely ask about tobacco use and advise tobacco users to stop, they have the potential to reach more than 80% of all tobacco users each year, to persuade 40% of cases to make an attempt to quit, and to help 2–3% of those receiving brief advice to quit successfully (132). Helping patients to quit tobacco as part of primary care providers' routine practice takes only 3–5 minutes and is feasible, effective and efficient. Even though there is a high proportion of smokers in detention settings (99), there also seems to be a high degree of willingness among this population to quit (133).

Using peers to deliver certain interventions may be an effective solution in some contexts where staff shortages cannot be overcome. Creating alternative methods of care provision that rely on arrangements made between ministries or down at the local level may also provide efficient solutions (Box 7).



## Box 7. Peer-to-peer health and first aid programme in Ireland<sup>134</sup>

In 2009 Ireland became the first country in the world to introduce a community-based health and first aid programme in prisons, in which detainees themselves became volunteer and health peer mentors. Established as an interdisciplinary partnership between the Irish Red Cross and education and justice authorities, by 2014 the programme had expanded to 14 prisons in the country and led to the implementation of 200 peer-based health promotion projects in areas covering HIV and hepatitis C screening, overdose prevention, and education on communicable and noncommunicable diseases. Evaluations of the programme demonstrated positive individual outcomes, including greater health awareness and empowerment, and community-wide improvements, such as greater bonds, higher testing rates and positive developments in the prison environment. The programme was awarded the WHO Best Practice in Prison Health Award in 2011.

Clinical independence is an essential feature that may, if lacking, effectively undermine any investment made in workforce development (7,9). The criminal justice system is unique in the sense that people receiving care in prison have been deprived of their liberty and prison staff are involved in issues of safety and security. However, clinical decisions should not be overruled by prison staff. The Mandela Rules (No. 25) clearly indicate that “the health-care service shall consist of an interdisciplinary team with sufficient qualified personnel acting in full clinical independence and shall encompass sufficient expertise in psychology and psychiatry. The services of a qualified dentist shall be available to every prisoner” (80). This is a basic principle but one that is still not followed everywhere (135).

### 5.1.2 Technologies and medicines

Use of technologies can greatly assist in addressing many challenges in health service delivery in prisons, including health staff shortages. Emerging alternatives include digital health interventions such as psychiatry teleconsultations, and in some specific situations remote peer support may be appropriate (136). Similar experiences in telemedicine in

general have also been described as a response to workforce shortages and financial and safety needs (137,138). A study evaluating the use of telemedicine to provide diabetes consultations to people in prison reported improvements in lowering blood pressure and in lipid control (115).

Inadequate access to essential medicines is a substantial barrier to high-quality health care, and this is true for the general population and even more for correctional settings (139). A target of 80% has been set for availability of affordable basic technologies and essential medicines, but chronic underfunding of the criminal justice system makes it hard to meet this target. Other targets set, including for 50% of the eligible population to have access to stroke prevention therapy, suffer from the same problem of underfunding.

### **5.1.3 Health surveillance and monitoring**

Regular health surveillance and monitoring of NCDs and their associated risk factors should form an integral part of prison health to ensure timely diagnosis, links to care and necessary follow-up. This would also ensure availability of comprehensive data to inform necessary interventions and policies. Creating systems that facilitate better understanding of the health status of the prison population is crucial.

The 2019 HIPED survey shows, however, that information systems in prisons in the WHO European Region cannot generally be used to measure the prevalence of NCDs (76). For example, only six countries provided information on tobacco use in prison, two countries on overweight and obesity, and eight countries on raised blood pressure. Although this does not necessarily imply that care is not provided to people in prison with risk factors for ill health, it does show that information on the care provided is not documented, which impedes monitoring as well as provision of the data needed to drive evidence-based policy-making.

Although research into prison populations varies widely across countries, both in terms of quantity and quality (16), some examples of surveillance and monitoring of NCDs exist. For example, CVD risk factor screening upon admission is common in US state prison systems, with some states reporting that they test all new admissions, while others report that they test on the basis of medical history, clinical indication or some other criteria (2,140). In England and Wales a targeted intervention has been introduced in prisons to ensure early diagnosis of common NCDs (Box 8).

## Box 8. Prison health checks in England and Wales

The Physical Health Check in Prison is a specific intervention developed in England and Wales that aims to address NCDs as a response to the ageing population. This initiative emerged as an adaptation of the NHS Health Check, which is available to the general population mainly through their general practitioner.<sup>16</sup> In these checks, risks of developing heart disease, stroke, diabetes and kidney disease are assessed predominantly through a patient's account of their own history, combined with evaluation of lifestyle habits, including alcohol consumption and smoking habits, and point-of-care testing for well-known risk factors such as cholesterol and blood pressure. Referral to primary care is possible when additional testing is needed. Adaptations made to the prison context include age cutoffs, where the lower age limit was reduced by 10 years, from 45 years in the community to 35 years in prison. These evaluations provide an opportunity for early detection and initiation of therapy when appropriate. Of the most common NCDs responsible for premature death, only cancer is left out of these assessments.

### 5.1.4 Continuity of care

Moments of transition of care are problematic across the entire health-care system. Prison is no exception; indeed, it presents a more serious situation, as psychosocial factors, in addition to medical ones, impact heavily on the course of life of an individual released from prison. Many errors that occur in transitions of care result from limited access to information, and this is certainly a problem in the criminal justice system. In many countries, paper-based records still prevail, and there is often little or no interoperability between prison health records and community-based records. There appear to be many barriers to the creation of efficient care pathways not only between correctional facilities and community care but also within prisons, including transfers between facilities, all of which add to the complexity of providing continuous medical treatment (141).

Other challenges include short stays and uncertainty of release date, which contribute to difficulty in planning for discharge (142). A qualitative study exploring barriers experienced in transition of care also highlighted the role of housing, employment, social services and supports, in addition to lack of access to health care and the level of discrimination experienced (143). A case-control study that used patient role-playing in fictitious scenarios requesting medical appointments confirmed this perceived discrimination, as it found that people who had never been imprisoned were twice as likely to be offered a first appointment as those recently released from prison (144). There are also reports of scarce use of primary care in the first month post release (145). However, the use of health care by people in prison is consistently higher than by the general population; this is probably explained by the higher burden of illness, although use decreases abruptly for primary care after release while sharply increasing for emergency care, hospitalization and psychiatric care (146). Success in overcoming these barriers has been made by various programmes set up to assist individuals following release from prison (Box 9).

### **Box 9. Post-release interventions to improve primary care integration**

The Transitions Clinic Network is a national network of 48 programmes across the USA which provides post-release health-care continuity support, particularly through access to primary care (147). The network has been developed through close partnership with formerly incarcerated leaders and each primary care programme includes a strong community dimension, involving community health workers who were formerly incarcerated as part of the medical team and close collaboration with re-entry and social services. Community health workers undergo a comprehensive training programme with a range of modules covering topics such as mentorship, professionalism, ethics, physical health, behavioural health and outreach. Their role involves helping patients during the transition period with both social and medical services. In addition, patients are paired with a clinician with prior experience of working with formerly incarcerated people. Research efforts are also undertaken to optimize the timing and quality of health service delivery for this group of patients. The Transitions Clinic Network programme has been shown to reduce emergency department use and return to correctional facilities following release (148,149).

Mortality increases sharply in the first month post release. Studies from Canada suggest that the standardized mortality ratio is greater than two for all chronic diseases (except certain cancers), compared with that observed in the general community. This study also stresses that the risk of dying is particularly high in the first two weeks post release (13). Similar studies conducted in the USA suggest that the risk of dying is 3.5 times higher for former prison inmates than for other state residents (150).

Nevertheless, the increased death risk reported is likely to result also from disruptions in the care received, including the ability to access health care and care providers and to obtain medication. For example, barriers to access to high-quality health care and perceived discrimination based on incarceration history have been reported (143). Disruptions in the provision of essential treatment, including methadone therapy, antiretroviral therapy and antipsychotic treatment, have also been described (151–153). Discontinuation of direct-acting antiviral treatment has been reported to be higher among people in prison, with over 40% of discontinuations attributable to release from prison (154). Also, it has been reported that incomplete tuberculosis treatments are associated with short-period prison stays and the inevitable increase in multidrug resistance that ensues (155).

The importance of care continuity also extends to the period prior to incarceration, as use of health care does not seem to be universal and data suggest that there are barriers to access for marginalized individuals. A study focusing on health-care utilization during the 12 months preceding incarceration revealed that nearly half of the participants had unmet medical needs and one third did not have a family doctor; at the same time, intense use of emergency care was reported (156).

There are many opportunities to improve health and health care for people with poor health status transitioning in and out of the prison system.<sup>6</sup> Successful trials have been described in which interventions to improve primary care engagement following release from prison have been tested; these trials have concluded that there are effective solutions to reduce inequalities which rely on ensuring that early access to primary care is available to people living with NCDs (148).

However, as has been noted, this capacity to intervene and ensure continuous care service provision often depends on the existence of effective partnerships between prison facilities and external health-care providers (157). More recently, in 2020, WHO stressed that health and justice systems must find solutions, which may vary in format between Member States, to ensure that the health care delivered to people in detention is recognized as part of a pathway to and from community health services.<sup>10</sup> This same document also highlighted the human rights approach to care and recognized that prison health is an important dimension of the commitment to leave no one behind as we seek to realize universal health coverage and to achieve the United Nations Sustainable Development Goals (SDGs), particularly SDG 3 and SDG 10.



## 5.2 Implementation principles and considerations

While there is plenty of evidence about the interventions that are most effective in preventing and managing NCD risk factors, only some of them have been adapted and tested in prison populations. There is an obvious need for further research in designing and adapting interventions to the criminal justice system, while preserving certain basic principles that are especially significant in the prison context. These include avoidance of stigmatization and respect for confidentiality, as well as the basic principle of nonmaleficence. The involvement of people who have lived experience of prison is believed to be an effective way to jointly create tailored interventions that have the best chance of being accepted in practice. For example, people with such experience have been involved in creatively designing interventions that allow increased physical activity within cells, which bring obvious benefits in circumstances where availability of and access to gyms is strictly limited.

Some of the interventions shown to be effective in the general population may need to be adapted for use in prisons, taking account of the particular contextual factors. Such factors may be specificities at the country level that affect whether changes can be implemented in the prison system. These could include general regulations in the country, socioeconomic and cultural aspects, the existence of subnationalities and special arrangements that apply to them, governance arrangements for prison health, and existing agreements and collaborations with community health care to ensure continuity of care.

Other interventions that are known to be effective in the general community can have perverse or unexpected effects in the context of deprivation of liberty. For instance, introducing a nonsmoking policy may lead people in prison to increase consumption of other drugs (158), so unless a combined approach to harmful substances is adopted, the full benefits may not be achieved. At the same time, such interventions need to be linked with community health services, so that benefits gained during incarceration can be sustained following release.

Another prime example is where implementation of a particular intervention may lead to conflict with the Ministry of Justice, because such implementation appears to condone breaking an established rule. This is the case with certain harm minimization interventions,



such as needle-and-syringe exchange programmes, and it is perhaps the reason why such programmes are sparingly used in the WHO European Region.

Integration of prison health and public health is of major importance. It has practical implications in terms of access to health-care records and interoperability of systems, which are particularly important to ensure safe transitions of care.

Tailoring interventions to the needs of special populations is also important. For example, women are accommodated in separate prisons from men and evidently have different needs; they have increased as a proportion of the prison population in recent years, but still represent a low proportion overall (159,160). Although in the general population men drink more alcohol than women and are more often diagnosed with alcohol use disorders, the proportion shifts in the prison population; imprisoned women more often meet the criteria of substance use disorders (including alcohol dependence) than men and are more prone to obesity and overweight, compared to the general population (72,161). This suggests that one of the priorities for intervention at female prisons should be nutrition and exercise, coupled with substance use interventions. Another example is foreign people living in prisons, whose numbers vary widely across the WHO European Region, but – as in the case of women – in most of the Region represent a minority group whose needs are neglected (162). Again, this population calls for differentiated interventions, not least in the use of additional languages in health education materials.



# 6

## Conclusions

The aim of the Health in Prisons Programme is to improve the health of people living in prison and other places of detention and to address SDG 3: “Ensure healthy lives and promote well-being for all at all ages” and SDG 10: “Reduce inequality within and among countries”. To achieve such aims, addressing the main causes of premature death is central. NCDs account for the majority of premature deaths worldwide, including in prisons. All efforts must therefore be centred on transforming prisons into health-promoting environments where there is an opportunity to engage in the prevention of NCDs. Early detection of NCDs improves disease prognosis and therefore maximizes the chances of success of any intervention. Many incarcerated individuals come from communities where there are significant barriers blocking access to care. Imprisonment may be an opportunity to reduce inequalities as governments have a duty of care for people deprived of their liberty.





# References

- 1 Learning from PPO investigations: natural cause deaths in prison custody 2007–2010. London: Prisons and Probation Ombudsman; 2012 ([https://s3-eu-west-2.amazonaws.com/ppo-production-1g9rkjhkhjmgw/uploads/2014/07/learning\\_from\\_ppo\\_investigations-natural\\_cause\\_deaths\\_in\\_prison\\_custody.pdf](https://s3-eu-west-2.amazonaws.com/ppo-production-1g9rkjhkhjmgw/uploads/2014/07/learning_from_ppo_investigations-natural_cause_deaths_in_prison_custody.pdf), accessed 9 November 2021).
- 2 Wang EA, Redmond N, Dennison Himmelfarb CR, Pettit B, Stern M et al. Cardiovascular disease in incarcerated populations. *J Am Coll Cardiol.* 2017;69(24):2967–76. doi:10.1016/j.jacc.2017.04.040.
- 3 Global Action Plan for the Prevention and Control of Noncommunicable Diseases. Geneva: World Health Organization; 2013 (<https://apps.who.int/iris/handle/10665/94384>, accessed 9 November 2021).
- 4 Thirteenth General Programme of Work, 2019–2023 (GPW 13). Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/279451>, accessed 9 November 2021).
- 5 Basic Principles for the Treatment of Prisoners. Adopted and proclaimed by General Assembly resolution 45/111 of 14 December 1990. New York (NY): Office of the United Nations High Commissioner for Human Rights; 1990 (<https://www.ohchr.org/Documents/ProfessionalInterest/basicprinciples.pdf>, accessed 9 November 2021).
- 6 Declaration of Prison Health as Part of Public Health. Adopted in Moscow on 24 October 2003. Copenhagen: WHO Regional Office for Europe; 2003 (<https://apps.who.int/iris/handle/10665/352130>, accessed 9 November 2021).
- 7 Good governance for prison health in the 21st century: a policy brief on the organization of prison health. Vienna: United Nations Office on Drugs and Crime/Copenhagen: WHO Regional Office for Europe; 2013 (<https://apps.who.int/iris/handle/10665/326388>, accessed 9 November 2021).
- 8 Principles of Medical Ethics Relevant to the Role of Health Personnel, Particularly Physicians, in the Protection of Prisoners and Detainees against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment. New York (NY): United Nations; 1982 (<https://www.un.org/ruleoflaw/blog/document/principles-of-medical-ethics-relevant-to-the-role-of-health-personnel-particularly-physicians-in-the-protection-of-prisoners-and-detainees-against-torture-and-other-cruel-inhuman-or-degrading-treatment>, accessed 9 November 2021).
- 9 Pont J, Enggist S, Stöver H, Williams B, Greifinger R, Wolff H. Prison health care governance: guaranteeing clinical independence. *Am J Public Health.* 2018;108(4):472–6. doi:10.2105/AJPH.2017.304248.
- 10 Leaving no one behind in prison health: the Helsinki Conclusions. Copenhagen: WHO Regional Office for Europe; 2020 (<https://apps.who.int/iris/handle/10665/352128>, accessed 9 November 2021).
- 11 Munday D, Leaman J, O'Moore É, Plugge E. The prevalence of non-communicable disease in older people in prison: a systematic review and meta-analysis. *Age Ageing.* 2019;48(2):204–12. doi:10.1093/ageing/afy186. PMID: 30590404.
- 12 Binswanger IA, Krueger PM, Steiner JF. Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. *J Epidemiol Community Health.* 2009;63(11):912–9. doi:10.1136/jech.2009.090662.
- 13 Kouyoumdjian FG, Kiefer L, Wobeser W, Gonzalez A, Hwang SW. Mortality over 12 years of follow-up in people admitted to provincial custody in Ontario: a retrospective cohort study. *CMAJ Open.* 2016;4(2):E153–61. doi:10.9778/cmajo.20150098.
- 14 Loeb SJ, Abudagga A. Health-related research on older inmates: an integrative review. *Res Nurs Health.* 2006;29(6):556–65. doi:10.1002/nur.20177.

- 15 Global prison trends 2021. London: Penal Reform International; 2021 (<https://www.penalreform.org/global-prison-trends-2021>, accessed 9 November 2021).
- 16 Stürup-Toft S, O'Moore EJ, Plugge EH. Looking behind the bars: emerging health issues for people in prison. *Br Med Bull.* 2018;125(1):15–23. doi:10.1093/bmb/ldx052.
- 17 Skarupski KA, Gross A, Schrack JA, Deal JA, Eber GB. The health of America's aging prison population. *Epidemiol Rev.* 2018;40(1):157–65. doi:10.1093/epirev/mxx020.
- 18 Gallagher EM. Elders in prison: health and well-being of older inmates. *Int J Law Psychiatry.* 2001;24(2–3):325–33. doi:10.1016/s0160-2527(00)00080-7.
- 19 Udo T. Chronic medical conditions in US adults with incarceration history. *Health Psychol.* 2019;38(3):217–25. doi:10.1037/hea0000720.
- 20 Kouyoumdjian FG, McConnon A, Herrington ERS, Fung K, Lofters A, Hwang SW. Cervical cancer screening access for women who experience imprisonment in Ontario, Canada. *JAMA Netw Open.* 2018;1(8):e185637. doi:10.1001/jamanetworkopen.2018.5637.
- 21 Winkelman TN, Choi H, Davis MM. The Affordable Care Act, insurance coverage, and health care utilization of previously incarcerated young men: 2008–2015. *Am J Public Health.* 2017;107(5):807–11. doi:10.2105/AJPH.2017.303703.
- 22 Kelly K. Medicare vs. Medicaid: everything you need to know. Jersey City (NJ): Forbes Health; 2021 (<https://www.forbes.com/health/healthy-aging/medicare-vs-medicaid>, accessed 9 November 2021).
- 23 Wright NM, Hearty P, Allgar V. Prison primary care and non-communicable diseases: a data-linkage survey of prevalence and associated risk factors. *BJGP Open.* 2019;3(2):bjgpopen19X101643. doi:10.3399/bjgpopen19X101643.
- 24 Wang EA, Pletcher M, Lin F, Vittinghoff E, Kertesz SG, Kiefe CI et al. Incarceration, incident hypertension, and access to health care: findings from the coronary artery risk development in young adults (CARDIA) study. *Arch Intern Med.* 2009;169(7):687–93. doi:10.1001/archinternmed.2009.26.
- 25 Coleman J, Lloyd-Jones DM, Ning H, Allen NB, Kiefe CI, Wang EA et al. Association between incarceration and incident cardiovascular disease events: results from the CARDIA cohort study. *BMC Public Health.* 2021;21(1):214. doi:10.1186/s12889-021-10237-6.
- 26 Noncommunicable diseases [online information hub]. Geneva: World Health Organization; 2021 ([https://www.who.int/health-topics/noncommunicable-diseases#tab=tab\\_1](https://www.who.int/health-topics/noncommunicable-diseases#tab=tab_1), accessed 9 November 2021).
- 27 Mental health [online information hub]. Geneva: World Health Organization; 2021 ([https://www.who.int/health-topics/mental-health#tab=tab\\_1](https://www.who.int/health-topics/mental-health#tab=tab_1), accessed 9 November 2021).
- 28 European cardiovascular disease statistics 2017. Brussels: European Heart Network; 2017 (<https://ehnheart.org/cvd-statistics.html>, accessed 9 November 2021).
- 29 Mortality in local jails and state prisons, 2000–2013: statistical tables. Washington (DC): Bureau of Justice Statistics of the US Department of Justice; 2015 (<https://bjs.ojp.gov/content/pub/pdf/mljisp0013st.pdf>, accessed 9 November 2021).
- 30 Maruschak LM, Berzofsky M, Unangst J. Medical problems of state and federal prisoners and jail inmates, 2011–12. Washington (DC): Bureau of Justice Statistics of the US Department of Justice; 2016 (<https://bjs.ojp.gov/content/pub/pdf/mpsfpji1112.pdf>, accessed 9 November 2021).
- 31 Prevalence of hypertension among adults aged 30–79 years. Global Health Observatory. Geneva: World Health Organization; 2021 (<https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-hypertension-among-adults-aged-30-79-years>, accessed 9 November 2021).
- 32 da Silva AZ, Mota RMS, Macena RHM, da Justa Pires Neto R, Ferreira MJM, de Araújo PF et al. Prevalence of hypertension and associated factors in female prison correctional officers in a national sample in Brazil. *J Occup Health.* 2020;62(1):e12163. doi:10.1002/1348-9585.12163.



- 33 Vera-Remartínez EJ, Borraz-Fernández JR, Domínguez-Zamorano JA, Mora-Parra LM, Casado-Hoces SV, González-Gómez JA et al. Prevalencia de patologías crónicas y factores de riesgo en población penitenciaria española [Prevalence of chronic diseases and risk factors among the Spanish prison population]. *Rev Esp Sanid Penit.* 2014;16(2):38–47 (in Spanish). doi:10.4321/S1575-06202014000200003.
- 34 Fobian AD, Froelich M, Sellers A, Cropsey K, Redmond N. Assessment of cardiovascular health among community-dwelling men with incarceration history. *J Urban Health.* 2018;95(4):556–63. doi:10.1007/s11524-018-0289-8.
- 35 Halvorsrud K, Nazroo J, Otis M, Brown Hajdukova E, Bhui K. Ethnic inequalities and pathways to care in psychosis in England: a systematic review and meta-analysis. *BMC Med.* 2018;16(1):223. doi:10.1186/s12916-018-1201-9.
- 36 Global status report on noncommunicable diseases 2014 – “Attaining the nine global noncommunicable diseases targets; a shared responsibility”. Geneva: World Health Organization; 2014 ([https://apps.who.int/iris/bitstream/handle/10665/148114/9789241564854\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/148114/9789241564854_eng.pdf), accessed 9 November 2021).
- 37 IDF diabetes atlas. 8th edition. Brussels: International Diabetes Federation; 2017 ([https://diabetesatlas.org/upload/resources/previous/files/8/IDF\\_DA\\_8e-EN-final.pdf](https://diabetesatlas.org/upload/resources/previous/files/8/IDF_DA_8e-EN-final.pdf), accessed 9 November 2021).
- 38 Simeni Njonou SR, Boombhi J, Etoa Etoga MC, Tiodoung Timnou A, Jingi AM, Nkem Efon K et al. Prevalence of diabetes and associated risk factors among a group of prisoners in the Yaoundé Central Prison. *J Diabetes Res.* 2020;2020:5016327. doi:10.1155/2020/5016327.
- 39 Rocca D. Prevalence of overweight and obesity in an Italian prison and relation with average term of detention: a pilot study. *Ann Ig.* 2018;30(1):51–6. doi:10.7416/ai.2018.2195.
- 40 Leigey ME, Johnston ME. The prevalence of overweight and obesity among aging female inmates. *J Correct Health Care.* 2015;21(3):276–85. doi:10.1177/1078345815588171.
- 41 Choudhry K, Armstrong D, Dregan A. Systematic review into obesity and weight gain within male prisons. *Obes Res Clin Pract.* 2018;12(4):327–35. doi:10.1016/j.orcp.2018.02.003.
- 42 Choudhry K, Armstrong D, Dregan A. Obesity and weight change in two United Kingdom male prisons. *J Correct Health Care.* 2019;25(4):328–37. doi:10.1177/1078345819879925.
- 43 Gebremariam MK, Nianogo RA, Arah OA. Weight gain during incarceration: systematic review and meta-analysis. *Obes Rev.* 2018;19(1):98–110. doi:10.1111/obr.12622.
- 44 Lagarrigue A, Ajana S, Capuron L, Féart C, Moisan MP. Obesity in French inmates: gender differences and relationship with mood, eating behavior and physical activity. *PLoS One.* 2017;12(1):e0170413. doi:10.1371/journal.pone.0170413.
- 45 Smoyer AB, Minke LK. Food systems in correctional settings: a literature review and case study. Copenhagen: WHO Regional Office for Europe; 2015 (<https://apps.who.int/iris/handle/10665/326323>, accessed 9 November 2021).
- 46 Audi C, Santiago SM, Andrade M, Assumpção D, Francisco P, Segall-Corrêa AM et al. Ultra-processed foods consumption among inmates in a women’s prison in São Paulo, Brazil. *Rev Esp Sanid Penit.* 2018;20(3):87–94.
- 47 Serving time: prisoner diet and exercise. London: National Audit Office; 2006 (<https://www.nao.org.uk/wp-content/uploads/2006/03/0506939.pdf>, accessed 9 November 2021).
- 48 Puglisi LB, Winkelman TNA, Gross CP, Wang EA. Cancer prevalence among adults with criminal justice involvement from a national survey. *J Gen Intern Med.* 2020;35(3):967–8. doi:10.1007/s11606-019-05177-2.
- 49 Kouyoumdjian FG, Pivnick L, Mclsaac KE, Wilton AS, Lofters A, Hwang SW. Cancer prevalence, incidence and mortality in people who experience incarceration in Ontario, Canada: a population-based retrospective cohort study. *PLoS One.* 2017;12(2):e0171131. doi:10.1371/journal.pone.0171131.

- 50 Cropsey K, Eldridge GD, Ladner T. Smoking among female prisoners: an ignored public health epidemic. *Addict Behav.* 2004;29(2):425–31. doi:10.1016/j.addbeh.2003.08.014.
- 51 Peters RH, Greenbaum PE, Edens JF, Carter CR, Ortiz MM. Prevalence of DSM-IV substance abuse and dependence disorders among prison inmates. *Am J Drug Alcohol Abuse.* 1998;24(4):573–87. doi:10.3109/00952999809019608.
- 52 Weinbaum CM, Sabin KM, Santibanez SS. Hepatitis B, hepatitis C, and HIV in correctional populations: a review of epidemiology and prevention. *AIDS.* 2005;19 Suppl 3:S41–6. doi:10.1097/01.aids.0000192069.95819.aa.
- 53 Sunthankar KI, Griffith KN, Talutis SD, Rosen AK, McAneny DB, Kulke MH et al. Cancer stage at presentation for incarcerated patients at a single urban tertiary care center. *PLoS One.* 2020;15(9):e0237439. doi:10.1371/journal.pone.0237439.
- 54 GBD 2015 Chronic Respiratory Disease Collaborators. Global, regional, and national deaths, prevalence, disability-adjusted life years, and years lived with disability for chronic obstructive pulmonary disease and asthma, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet Respir Med.* 2017;5(9):691–706. doi:10.1016/S2213-2600(17)30293-X.
- 55 Bai JR, Befus M, Mukherjee DV, Lowy FD, Larson EL. Prevalence and predictors of chronic health conditions of inmates newly admitted to maximum security prisons. *J Correct Health Care.* 2015;21(3):255–64. doi:10.1177/1078345815587510.
- 56 Afonso AS, Verhamme KM, Sturkenboom MC, Brusselle GG. COPD in the general population: prevalence, incidence and survival. *Respir Med.* 2011;105(12):1872–84. doi:10.1016/j.rmed.2011.06.012.
- 57 Bania EG, Daniil Z, Hatzoglou C, Alexopoulos EC, Mitsiki E, Gourgoulialis KI. COPD characteristics and socioeconomic burden in Hellenic correctional institutions. *Int J Chron Obstruct Pulmon Dis.* 2016;11:341–9. doi:10.2147/COPD.S89027.
- 58 Fazel S, Hayes AJ, Bartellas K, Clerici M, Trestman R. Mental health of prisoners: prevalence, adverse outcomes, and interventions. *Lancet Psychiatry.* 2016;3(9):871–81. doi:10.1016/S2215-0366(16)30142-0.
- 59 Baranyi G, Scholl C, Fazel S, Patel V, Priebe S, Mundt AP. Severe mental illness and substance use disorders in prisoners in low-income and middle-income countries: a systematic review and meta-analysis of prevalence studies. *Lancet Glob Health.* 2019;7(4):e461–e471. doi:10.1016/S2214-109X(18)30539-4.
- 60 Audi CAF, Santiago SM, Andrade MDGG, Francisco PMSB. Common mental disorder among incarcerated women: a study on prevalence and associated factors. *Cien Saude Colet.* 2018;23(11):3587–96. doi:10.1590/1413-812320182311.30372016.
- 61 Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. *Int J Epidemiol.* 2014;43(2):476–93. doi:10.1093/ije/dyu038.
- 62 McCall JD, Tsai J. Characteristics and health needs of veterans in jails and prisons: what we know and do not know about incarcerated women veterans. *Womens Health Issues.* 2018;28(2):172–80. doi:10.1016/j.whi.2017.10.009.
- 63 Tye CS, Mullen PE. Mental disorders in female prisoners. *Aust NZ J Psychiatry.* 2006;40(3):266–71. doi:10.1080/j.1440-1614.2006.01784.x.
- 64 Birecree EA, Bloom JD, Leverette MD, Williams M. Diagnostic efforts regarding women in Oregon's prison system: a preliminary report. *Int J Offender Ther Comp Criminol.* 1994;38(3):217–30. doi:10.1177/0306624X9403800304.
- 65 Aday R, Farney L. Malign neglect: assessing older women's health care experiences in prison. *J Bioeth Inq.* 2014;11(3):359–72. doi:10.1007/s11673-014-9561-0.
- 66 Fazel S, Baillargeon J. The health of prisoners. *Lancet.* 2011;377(9769):956–65. doi:10.1016/S0140-6736(10)61053-7.

- 67 Fazel S, Ramesh T, Hawton K. Suicide in prisons: an international study of prevalence and contributory factors. *Lancet Psychiatry*. 2017;4(12):946–52. doi:10.1016/S2215-0366(17)30430-3.
- 68 WHO and UN partners' compendium of 500 actions aims to reduce diseases from environmental factors and save lives [news item]. Geneva: World Health Organization; 2021 (<https://www.who.int/news/item/03-09-2021-who-and-un-partners-compendium-of-500-actions-aims-to-reduce-diseases-from-environmental-factors-and-save-lives>, accessed 9 November 2021).
- 69 Peters R, Ee N, Peters J, Beckett N, Booth A, Rockwood K et al. Common risk factors for major noncommunicable disease, a systematic overview of reviews and commentary: the implied potential for targeted risk reduction. *Ther Adv Chronic Dis*. 2019;10:2040622319880392. doi:10.1177/2040622319880392.
- 70 Parkes T, MacAskill S, Brooks O, Jepson R, Atherton I, Doi L. Prison health needs assessment for alcohol problems. Edinburgh: NHS Health Scotland; 2011 (<http://www.ohrn.nhs.uk/resource/policy/PrisonHealthNeedsAssessmentAlcohol.pdf>, accessed 9 November 2021).
- 71 MacAskill S, Parkes T, Brooks O, Graham L, McAuley A, Brown A. Assessment of alcohol problems using AUDIT in a prison setting: more than an “aye or no” question. *BMC Public Health*. 2011;11:865. doi:10.1186/1471-2458-11-865.
- 72 Herbert K, Plugge E, Foster C, Doll H. Prevalence of risk factors for non-communicable diseases in prison populations worldwide: a systematic review. *Lancet*. 2012;379(9830):1975–82. doi:10.1016/S0140-6736(12)60319-5.
- 73 Fischer J, Butt C, Dawes H, Foster C, Neale J, Plugge E et al. Fitness levels and physical activity among class A drug users entering prison. *Br J Sports Med*. 2012;46(16):1142–4. doi:10.1136/bjsports-2011-090724.
- 74 Pont J, Stöver H, Gétaz L, Casillas A, Wolff H. Prevention of violence in prison: the role of health care professionals. *J Forensic Leg Med*. 2015;34:127–32. doi:10.1016/j.jflm.2015.05.014.
- 75 Noncommunicable Diseases Global Monitoring Framework: indicator definitions and specifications. Geneva: World Health Organization; 2014 ([http://www.who.int/nmh/ncd-tools/indicators/GMF\\_Indicator\\_Definitions\\_Version\\_NOV2014.pdf](http://www.who.int/nmh/ncd-tools/indicators/GMF_Indicator_Definitions_Version_NOV2014.pdf), accessed 9 November 2021).
- 76 Status report on prison health in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2019 (<https://apps.who.int/iris/handle/10665/329943>, accessed 9 November 2021).
- 77 Danish model on food systems in correctional facilities. Brussels: European Commission; 2016 (<https://webgate.ec.europa.eu/dyna/bp-portal/practice.cfm?id=103>, accessed 9 November 2021).
- 78 Gil-Delgado Y, Domínguez-Zamorano JA, Martínez-Sánchez-Suárez E. Valoración de los beneficios para la salud conseguidos mediante un programa nutricional dirigido a internos con factores de riesgo cardiovascular del Centro Penitenciario de Huelva [Assessment of health benefits from a nutrition programme aimed at inmates with cardiovascular risk factors at Huelva Prison]. *Rev Esp Sanid Penit*. 2011;13(3):75–83 (in Spanish). doi:10.1590/S1575-06202011000300002.
- 79 Global Action Plan on Physical Activity 2018–2030: more active people for a healthier world. Copenhagen: WHO Regional Office for Europe; 2018 (<http://apps.who.int/iris/bitstream/handle/10665/272722/9789241514187-eng.pdf>, accessed 9 November 2021).
- 80 United Nations Standard Minimum Rules for the Treatment of Prisoners (the Nelson Mandela Rules). United Nations General Assembly Resolution A/RES/70/175, adopted 17 December 2015. New York (NY): United Nations; 2015 (<https://undocs.org/A/RES/70/175>, accessed 9 November 2021).
- 81 Ortega Vila G, Abad Robles MT, Robles Rodríguez J, Durán González LJ, Franco Martín J, Jiménez Sánchez AC et al. Analysis of a sports-educational program in prisons. *Int J Environ Res Public Health*. 2020;17(10):3467. doi:10.3390/ijerph17103467.
- 82 Gallant D, Turner G. Giving prisoners a sporting chance. Melbourne: Pursuit (University of Melbourne); 2019 (<https://pursuit.unimelb.edu.au/articles/giving-prisoners-a-sporting-chance>, accessed 9 November 2021).

- 83 Elwood Martin R, Adamson S, Korchinski M, Granger-Brown A, Ramsden VR, Buxton JA et al. Incarcerated women develop a nutrition and fitness program: participatory research. *Int J Prison Health*. 2013;9(3):142–50. doi:10.1108/IJPH-03-2013-0015.
- 84 Sanchez-Lastra MA, de Dios Álvarez V, Ayán Pérez C. Effectiveness of prison-based exercise training programs: a systematic review. *J Phys Act Health*. 2019;16(12):1196–1209. doi:10.1123/jpah.2019-0049.
- 85 Wurcel AG, Dauria E, Zaller N, Nijhawan A, Beckwith C, Nowotny K et al. Spotlight on jails: COVID-19 mitigation policies needed now. *Clin Infect Dis*. 2020;71(15):891–2. doi:10.1093/cid/ciaa346.
- 86 Gallagher C. Prisons see huge increase in “hooch” seizures during lockdown. *The Irish Times*. 11 August 2020 (<https://www.irishtimes.com/news/crime-and-law/prisons-see-huge-increase-in-hooch-seizures-during-lockdown-1.4326878>, accessed 9 November 2021).
- 87 Prisons and health. Copenhagen: WHO Regional Office for Europe; 2014 (<https://apps.who.int/iris/handle/10665/128603>, accessed 9 November 2021).
- 88 Stein LA, Clair M, Lebeau R, Colby SM, Barnett NP, Golembeske C et al. Motivational interviewing to reduce substance-related consequences: effects for incarcerated adolescents with depressed mood. *Drug Alcohol Depend*. 2011;118(2–3):475–8. doi:10.1016/j.drugalcdep.2011.03.023.
- 89 Woodall WG, Delaney HD, Kunitz SJ, Westerberg VS, Zhao H. A randomized trial of a DWI intervention program for first offenders: intervention outcomes and interactions with antisocial personality disorder among a primarily American-Indian sample. *Alcohol Clin Exp Res*. 2007;31(6):974–87. doi:10.1111/j.1530-0277.2007.00380.x.
- 90 Kouyoumdjian FG, Mclsaac KE, Liauw J, Green S, Karachiwalla F, Siu W et al. A systematic review of randomized controlled trials of interventions to improve the health of persons during imprisonment and in the year after release. *Am J Public Health*. 2015;105(4):e13–33. doi:10.2105/AJPH.2014.302498.
- 91 de Andrade D, Ritchie J, Rowlands M, Mann E, Hides L. Substance use and recidivism outcomes for prison-based drug and alcohol interventions. *Epidemiol Rev*. 2018;40(1):121–33. doi:10.1093/epirev/mxy004.
- 92 Doyle MF, Shakeshaft A, Guthrie J, Snijder M, Butler T. A systematic review of evaluations of prison-based alcohol and other drug use behavioural treatment for men. *Aust NZ J Public Health*. 2019;43(2):120–30. doi:10.1111/1753-6405.12884.
- 93 National Center on Addiction and Substance Abuse of Columbia University (CASA). Behind bars II: substance abuse and America’s prison population. Washington (DC): Office of Justice Programs; 2010 (<https://www.ojp.gov/ncjrs/virtual-library/abstracts/behind-bars-ii-substance-abuse-and-americas-prison-population>, accessed 9 November 2021).
- 94 The health of Australia’s prisoners. Canberra: Australian Institute of Health and Welfare; 2015 (<https://www.aihw.gov.au/getmedia/9c42d6f3-2631-4452-b0df-9067fd71e33a/aihw-phe-207.pdf>, accessed 9 November 2021).
- 95 Huriwai T. Innovative alcohol- and drug-user treatment of inmates in New Zealand prisons. *Subst Use Misuse*. 2002;37(8–10):1035–45. doi:10.1081/ja-120004164.
- 96 Lapham S. Screening and brief intervention in the criminal justice system. *Alcohol Res Health*. 2004–2005;28(2):85–93.
- 97 de Andrade D, Kinner SA. Systematic review of health and behavioural outcomes of smoking cessation interventions in prisons. *Tob Control*. 2016;26(5):495–501. doi:10.1136/tobaccocontrol-2016-053297.
- 98 Wilson A, Guillaumier A, George J, Denham A, Bonevski B. A systematic narrative review of the effectiveness of behavioural smoking cessation interventions in selected disadvantaged groups (2010–2017). *Expert Rev Respir Med*. 2017;11(8):617–30. doi:10.1080/17476348.2017.1340836.
- 99 Spaulding AC, Eldridge GD, Chico CE, Morisseau N, Drobeniuc A, Fils-Aime R et al. Smoking in correctional settings worldwide: prevalence, bans, and interventions. *Epidemiol Rev*. 2018;40(1):82–95. doi:10.1093/epirev/mxy005.

- 100 Turan O, Turan PA. Smoking-related behaviors and effectiveness of smoking cessation therapy among prisoners and prison staff. *Respir Care*. 2016;61(4):434–8. doi:10.4187/respcare.04122.
- 101 Puljević C, de Andrade D, Carroll M, Spittal MJ, Kinner SA. Use of prescribed smoking cessation pharmacotherapy following release from prison: a prospective data linkage study. *Tob Control*. 2018;27(4):474–8. doi:10.1136/tobaccocontrol-2017-053743.
- 102 The implementation of smokefree prisons in England and Wales. London: Action on Smoking and Health; 2018 (<https://ash.org.uk/information-and-resources/briefings/ash-briefing-the-implementation-of-smokefree-prisons-in-england-and-wales>, accessed 9 November 2021).
- 103 Brown A, Sweeting H, Logan G, Demou E, Hunt K. Prison staff and prisoner views on a prison smoking ban: evidence from the Tobacco in Prisons Study. *Nicotine Tob Res*. 2019;21(8):1027–35. doi:10.1093/ntr/nty092.
- 104 Clarke JG, Stein LA, Martin RA, Martin SA, Parker D, Lopes CE et al. Forced smoking abstinence: not enough for smoking cessation. *JAMA Intern Med*. 2013;173(9):789–94. doi:10.1001/jamainternmed.2013.197.
- 105 Sweeting H, Demou E, Brown A, Hunt K. Prisoners and prison staff express increased support for prison smoking bans following implementation across Scotland: results from the Tobacco In Prisons study. *Tob Control*. 2021;30(5):597–8. doi:10.1136/tobaccocontrol-2020-055683.
- 106 Demou E, Dobson R, Sweeting H, Brown A, Sidwell S, O'Donnell R et al. From smoking-permitted to smokefree prisons: a 3-year evaluation of the changes in occupational exposure to second-hand smoke across a national prison system. *Ann Work Expo Health*. 2020;64(9):959–69. doi:10.1093/annweh/wxaa073.
- 107 Semple S, Dobson R, Sweeting H, Brown A, Hunt K, Tobacco in Prisons (TIPs) research team. The impact of implementation of a national smoke-free prisons policy on indoor air quality: results from the Tobacco in Prisons study. *Tob Control*. 2020;29(2):234–6. doi:10.1136/tobaccocontrol-2018-054895.
- 108 Brown A, O'Donnell R, Eadie D, Ford A, Mitchell D, Hackett A et al. E-cigarette use in prisons with recently established smokefree policies: a qualitative interview study with people in custody in Scotland. *Nicotine Tob Res*. 2021;23(6):939–46. doi:10.1093/ntr/ntaa271.
- 109 Binswanger IA, Carson EA, Krueger PM, Mueller SR, Steiner JF, Sabol WJ. Prison tobacco control policies and deaths from smoking in United States prisons: population based retrospective analysis. *BMJ*. 2014;349:g4542. doi:10.1136/bmj.g4542.
- 110 WHO report on the global tobacco epidemic 2021: addressing new and emerging products. Geneva: World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/343287>, accessed 9 November 2021).
- 111 Firth CL, Sazie E, Hedberg K, Drach L, Maher J. Female inmates with diabetes: results from changes in a prison food environment. *Womens Health Issues*. 2015;25(6):732–8. doi:10.1016/j.whi.2015.07.009.
- 112 Martínez-Delgado MM, Ramírez-López C. Cardiovascular health education intervention in the Prison of Soria. *Rev Esp Sanid Penit*. 2016;18(1):5–11. doi:10.4321/S1575-06202016000100002.
- 113 Datey P, Hankey A, Nagendra HR. Combined Ayurveda and yoga practices for newly diagnosed type 2 diabetes mellitus: a controlled trial. *Complement Med Res*. 2018;25(1):16–23. doi:10.1159/000464441.
- 114 Bingham JT, Mallette JJ. Federal Bureau of Prisons clinical pharmacy program improves patient A1C. *J Am Pharm Assoc (2003)*. 2016;56(2):173–7. doi:10.1016/j.japh.2016.01.002.
- 115 Kassir K, Roe C, Desimone M. Use of telemedicine for management of diabetes in correctional facilities. *Telemed J E Health*. 2017;23(1):55–9. doi:10.1089/tmj.2016.0036.
- 116 Brutus L, Mackie P, Millard A, Fraser A, Conacher A, Hardie S et al. Better health, better lives for prisoners: a framework for improving the health of Scotland's prisoners. Vol. 1. The framework. Edinburgh: Scottish Prison Service; 2012 (<https://www.scotphn.net/wp-content/uploads/2015/10/A-framework-for-improving-the-health-of-Scotlands-prisoners-Volume-1.pdf>, accessed 9 November 2021).



- 117 Johnson RA, Milner KA, Heng C, Greer AE, DeNisco S. Implementation and evaluation of a physical activity and dietary program in federal incarcerated females. *J Correct Health Care*. 2018;24(4):395–406. doi:10.1177/1078345818793142.
- 118 Baldwin N, Cardoos A, Clarke JG. Understanding weight change while incarcerated: qualitative groundwork for a collaborative health intervention. *Obes Control Ther*. 2017;4(1):1–7. doi:10.15226/2374-8354/4/1/00131.
- 119 Donahue J. Coronary artery disease in offender populations: incarceration as a risk factor and a point of intervention. *J Correct Health Care*. 2014;20(4):302–12. doi:10.1177/1078345814541534.
- 120 Mohan ARM, Thomson P, Leslie SJ, Dimova E, Haw S, McKay JA. A systematic review of interventions to improve health factors or behaviors of the cardiovascular health of prisoners during incarceration. *J Cardiovasc Nurs*. 2018;33(1):72–81. doi:10.1097/JCN.0000000000000420.
- 121 WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. 2nd edition. Geneva: World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/342366>, accessed 9 November 2021).
- 122 Live life: an implementation guide for suicide prevention in countries. Geneva: World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/341726>, accessed 9 November 2021).
- 123 WHO Prison Health Framework: a framework for assessment of prison health system performance. Copenhagen: WHO Regional Office for Europe; 2021 (<https://apps.who.int/iris/handle/10665/344561>, accessed 24 November 2021).
- 124 Organizational models of prison health: considerations for better governance. Copenhagen: WHO Regional Office for Europe; 2020 (<https://apps.who.int/iris/handle/10665/336214>, accessed 9 November 2021).
- 125 The list of nursing competencies is derived from Sánchez-Roig M, Coll-Cámara A. Prison nursing and its training. *Rev Esp Sanid Penit*. 2016;18(3):110–18. doi:10.4321/S1575-06202016000300005.
- 126 Alemagno SA, Wilkinson M, Levy L. Medical education goes to prison: why? *Acad Med*. 2004;79(2):123–7. doi:10.1097/00001888-200402000-00005.
- 127 Brooker R, Hu W, Reath J, Abbott P. Medical student experiences in prison health services and social cognitive career choice: a qualitative study. *BMC Med Educ*. 2018;18(1):3. doi:10.1186/s12909-017-1109-7.
- 128 Status report on prison health in the WHO European Region (2021). Copenhagen: WHO Regional Office for Europe; [forthcoming in 2022].
- 129 Bick J, Culbert G, Al-Darraj HA, Koh C, Pillai V, Kamarulzaman A et al. Healthcare resources are inadequate to address the burden of illness among HIV-infected male prisoners in Malaysia. *Int J Prison Health*. 2016;12(4):253–69. doi:10.1108/IJPH-06-2016-0017.
- 130 Kaftarian E. Lessons learned in prison and jail-based telepsychiatry. *Curr Psychiatry Rep*. 2019;21(3):15. doi:10.1007/s11920-019-1004-5.
- 131 Lazzari T, Terzoni S, Destrebecq A, Meani L, Bonetti L, Ferrara P. Moral distress in correctional nurses: a national survey. *Nurs Ethics*. 2020;27(1):40–52. doi:10.1177/0969733019834976.
- 132 Toolkit for delivering the 5A's and 5R's brief tobacco interventions in primary care. Geneva: World Health Organization; 2014 ([https://apps.who.int/iris/bitstream/handle/10665/112835/9789241506953\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/112835/9789241506953_eng.pdf), accessed 9 November 2021).
- 133 Ahalt C, Buisker T, Myers J, Williams B. Smoking and smoking cessation among criminal justice-involved older adults. *Tob Use Insights*. 2019;12:1179173X19833357. doi:10.1177/1179173X19833357.
- 134 Prison programme: community based health and first aid. Dublin: Irish Red Cross; [n.d.] (<https://www.redcross.ie/programmes-and-services-in-ireland/prison-programme-community-based-health-first-aid>, accessed 9 November 2021).



- 135 Vivancos C, Rivera I. Medical examination of detainees in Catalonia, Spain, carried out in the presence of police officers. *Torture*. 2020;30(1):49–53. doi:10.7146/torture.v30i1.119257.
- 136 Chapman SA, Blash LK, Mayer K, Spetz J. Emerging roles for peer providers in mental health and substance use disorders. *Am J Prev Med*. 2018;54(6 Suppl 3):S267–S274. doi:10.1016/j.amepre.2018.02.019.
- 137 Bertin C, Diakite A, Carton B, Wozniak C, Nathanson S, Monnier S et al. Télédermatologie unissant deux hôpitaux: deux ans d'expérience [Teledermatology between two French hospitals: two years of experience]. *Ann Dermatol Venereol*. 2017;144(12):759–67 (in French). doi:10.1016/j.annder.2017.06.011.
- 138 Mateo M, Álvarez R, Cobo C, Pallas JR, López AM, Gaité L. Telemedicine: contributions, difficulties and key factors for implementation in the prison setting. *Rev Esp Sanid Penit*. 2019;21(2):95–105.
- 139 Spearman CW, Dusheiko GM, Hellard M, Sonderup M. Hepatitis C. *Lancet*. 2019;394(10207):1451–66. doi:10.1016/S0140-6736(19)32320-7.
- 140 Maruschak L, Chari KA, Simon AE, DeFrances CJ. National Survey of Prison Health Care: selected findings. *Natl Health Stat Report*. 2016;(96):1–23.
- 141 Kouyoumdjian F, Wiwcharuk J, Green S. Optimizing continuity of care throughout incarceration: case and opportunities. *Can Fam Physician*. 2015;61(2):107–9, e70–2.
- 142 Booker CA, Flygare CT, Solomon L, Ball SW, Pustell MR, Bazerman LB et al. Linkage to HIV care for jail detainees: findings from detention to the first 30 days after release. *AIDS Behav*. 2013;17 Suppl 2:S128–36. doi:10.1007/s10461-012-0354-3.
- 143 Hu C, Jurgutis J, Edwards D, O'Shea T, Regenstreif L, Bodkin C et al. "When you first walk out the gates ... where do [you] go?": barriers and opportunities to achieving continuity of health care at the time of release from a provincial jail in Ontario. *PLoS One*. 2020;15(4):e0231211. doi:10.1371/journal.pone.0231211.
- 144 Fahmy N, Kouyoumdjian FG, Berkowitz J, Fahmy S, Neves CM, Hwang SW et al. Access to primary care for persons recently released from prison. *Ann Fam Med*. 2018;16(6):549–51. doi:10.1370/afm.2314.
- 145 Kouyoumdjian FG, Cheng SY, Fung K, Humphreys-Mahaffey S, Orkin AM, Kendall C et al. Primary care utilization in people who experience imprisonment in Ontario, Canada: a retrospective cohort study. *BMC Health Serv Res*. 2018;18(1):845. doi:10.1186/s12913-018-3660-2.
- 146 Kouyoumdjian FG, Cheng SY, Fung K, Orkin AM, Mclsaac KE, Kendall C et al. The health care utilization of people in prison and after prison release: a population-based cohort study in Ontario, Canada. *PLoS One*. 2018;13(8):e0201592. doi:10.1371/journal.pone.0201592.
- 147 Evaluation and quality improvement. San Francisco (CA): Transitions Clinic Network; [n.d.] (<https://transitionsclinic.org/evaluation-quality-improvement>, accessed 9 November 2021).
- 148 Wang EA, Hong CS, Shavit S, Sanders R, Kessel E, Kushel MB. Engaging individuals recently released from prison into primary care: a randomized trial. *Am J Public Health*. 2012;102(9):e22–9. doi:10.2105/AJPH.2012.300894.
- 149 Wang EA, Lin HJ, Aminawung JA, Busch SH, Gallagher C, Maurer K et al. Propensity-matched study of enhanced primary care on contact with the criminal justice system among individuals recently released from prison to New Haven. *BMJ Open*. 2019;9(5):e028097. doi:10.1136/bmjopen-2018-028097.
- 150 Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG et al. Release from prison: a high risk of death for former inmates. *N Engl J Med*. 2007;356(2):157–65. doi:10.1056/NEJMsa064115.
- 151 Fu JJ, Zaller ND, Yokell MA, Bazazi AR, Rich JD. Forced withdrawal from methadone maintenance therapy in criminal justice settings: a critical treatment barrier in the United States. *J Subst Abuse Treat*. 2013;44(5):502–5. doi:10.1016/j.jsat.2012.10.005.

- 152 Springer SA, Spaulding AC, Meyer JP, Altice FL. Public health implications for adequate transitional care for HIV-infected prisoners: five essential components. *Clin Infect Dis*. 2011;53(5):469–79. doi:10.1093/cid/cir446.
- 153 Baillargeon J, Hoge SK, Penn JV. Addressing the challenge of community reentry among released inmates with serious mental illness. *Am J Community Psychol*. 2010;46(3–4):361–75. doi:10.1007/s10464-010-9345-6.
- 154 Marco A, Roget M, Cervantes M, Forné M, Planella R, Miquel M et al. Comparison of effectiveness and discontinuation of interferon-free therapy for hepatitis C in prison inmates and noninmates. *J Viral Hepat*. 2018;25(11):1280–6. doi:10.1111/jvh.12940.
- 155 Pape S, Groß F, Ulrichs T. Die Tuberkulosesituation im Berliner Justizvollzug 2011–2016: eine Folgeerhebung [The tuberculosis situation in the Berlin prison system from 2011–2016: a follow-up study]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. 2019;62(7):893–903 (in German). doi:10.1007/s00103-019-02977-z.
- 156 Green S, Foran J, Kouyoumdjian FG. Access to primary care in adults in a provincial correctional facility in Ontario. *BMC Res Notes*. 2016;9:131. doi:10.1186/s13104-016-1935-4.
- 157 Prevention of acute drug-related mortality in prison populations during the immediate post-release period, 2014 update. Copenhagen: WHO Regional Office for Europe; 2014 (<https://apps.who.int/iris/handle/10665/326483>, accessed 9 November 2021).
- 158 Sarlin E. Cigarette smoking increases the likelihood of drug use relapse. Bethesda (MD): National Institute on Drug Abuse; 2018 (<https://www.drugabuse.gov/news-events/nida-notes/2018/05/cigarette-smoking-increases-likelihood-drug-use-relapse>, accessed 9 November 2021).
- 159 Global prison trends 2020. Second version, May 2020. London: Penal Reform International/Thailand Institute of Justice; 2020 (<https://www.penalreform.org/resource/global-prison-trends-2020>, accessed 9 November 2021).
- 160 World Prison Brief [online database]. Highest to lowest: female prisoners (percentage of prison population). London: Institute for Crime and Justice Policy Research (<https://www.prisonstudies.org/highest-to-lowest/female-prisoners>, accessed 9 November 2021).
- 161 Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: a systematic review. *Addiction*. 2006;101(2):181–91. doi:10.1111/j.1360-0443.2006.01316.x.
- 162 World Prison Brief [online database]. Highest to lowest: foreign prisoners (percentage of prison population). London: Institute for Crime and Justice Policy Research (<https://www.prisonstudies.org/highest-to-lowest/foreign-prisoners>, accessed 9 November 2021).



## The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

### Member States

Albania	Greece	Portugal
Andorra	Hungary	Republic of Moldova
Armenia	Iceland	Romania
Austria	Ireland	Russian Federation
Azerbaijan	Israel	San Marino
Belarus	Italy	Serbia
Belgium	Kazakhstan	Slovakia
Bosnia and Herzegovina	Kyrgyzstan	Slovenia
Bulgaria	Latvia	Spain
Croatia	Lithuania	Sweden
Cyprus	Luxembourg	Switzerland
Czechia	North Macedonia	Tajikistan
Denmark	Malta	Turkey
Estonia	Monaco	Turkmenistan
Finland	Montenegro	Ukraine
France	Netherlands	United Kingdom
Georgia	Norway	Uzbekistan
Germany	Poland	

WHO/EURO:2022-4912-44675-63435

**WHO European Office for the Prevention and  
Control of Noncommunicable Diseases**  
9, Leontievsky pereulok  
125009 Moscow, Russian Federation  
**Tel.:** +7 (495) 787 21 17  
**Email:** [NCDoffice@who.int](mailto:NCDoffice@who.int)  
**Website:** [www.euro.who.int/en/NCDoffice](http://www.euro.who.int/en/NCDoffice)