**Script \_Healthcare system awareness**

**Slide 1:** Welcome to the first learning unit of Educational Module 3. This module offers an overview of contemporary health systems within the context of rapid scientific progress and digital transformation. We will also examine the challenges these systems face and the obstacles to meaningful improvement. Next, we’ll introduce the key themes that form the foundation of this learning block, paving the way for a deeper understanding of healthcare systems.

**Slide 2:** In this learning block, we will cover several interconnected thematic entities: Health System objectives and building blocks; the integration of digital technology within modern health systems; performance indices to evaluate health systems; weaknesses and challenges confronting today’s systems; and approaches to mitigating interprofessional conflicts through digital solutions. Each section is designed to build upon the previous one, offering a comprehensive and interconnected perspective on the complexities of modern healthcare. Next, we will focus on the key outcomes you can expect from this unit, highlighting how this knowledge will be applied to real-world contexts.

**Slide 3:** By the end of this unit, you will have a robust understanding of the structure and characteristics of national healthcare systems, with a special emphasis on e-Health platforms and digital services. You will also be introduced to critical concepts such as efficiency and effectiveness in healthcare delivery. Through our case-based methodology, we aim to foster a holistic perspective, enabling you to define strategies for improvement and explore how digital solutions can enhance healthcare processes.

**Slide 4:** In the first part of this unit, we will explore the structure of modern health systems in detail.

**Slide 5**: Let’s begin by defining what a health system is. According to the World Health Organisation, a health system consists of all people, institutions, and resources organized according to policies that aim to improve the health of a population. It must respond to people’s legitimate expectations and protect them against the cost of ill-health. This is achieved through various activities designed to promote, prevent, cure, and rehabilitate health. Both State and non-State actors play critical roles in delivering personal health care within this system.

**Slide 6**: What should a well-functioning health system provide? First and foremost, it should improve the health status of individuals, families, and communities while also protecting the population from health threats through preventive strategies. Protection also extends to shielding individuals from the financial consequences of illness. Moreover, equitable access to patient-centered care is essential, along with enabling people to participate in health-related decisions.

**Slide 7**: Now, let’s examine the key building blocks of a health system. These include the health workforce, service delivery mechanisms, health information systems, access to essential medications, financing, and leadership and governance. These components must interact effectively to ensure access, coverage, cohesion, and high-quality services, ultimately leading to patient safety.

**Slide 8**: While all components are critical, the health workforce stands out as particularly important. This block is highly diverse, involving a wide array of roles, authorities, and backgrounds—from healthcare providers to administrative staff. Ensuring cohesion among these diverse categories is essential for comprehensive healthcare delivery.

**Slide 9:** For a healthcare system to function effectively, services must be clearly organized into four levels: primary, secondary, tertiary, and quaternary care. Each level represents an increasing degree of specialization. Primary care acts as the initial point of contact, addressing essential healthcare needs such as preventive care, health education, and chronic disease management. It also serves as a gateway, referring patients to more specialized services when necessary. Secondary care builds on this foundation by offering specialized treatments, often provided by professionals such as cardiologists or dermatologists. Tertiary care comes into play when dealing with complex or rare conditions, requiring advanced facilities and expertise—for example, oncology or neurosurgery. At the highest level, quaternary care addresses highly specialized medical interventions, such as experimental treatments or cutting-edge genetic therapies. While patients may progress through these levels, there is often a step-down process where they return to primary care for follow-up and ongoing support. This emphasizes the critical importance of seamless communication and collaboration across all levels of care. With this understanding of service organization, let’s shift our focus to examine the broader dynamics of healthcare systems, particularly the interplay between public and privately funded sectors.

**Slide 10:** We invite you now to reflect on the advantages and disadvantages of both the public and privately-funded sectors of a health system. How do these sectors compare across different countries, particularly within the European Union?

**Slide 11:** In the next part, we will summarise the digital tools used in modern health systems.

**Slide 12:** A digital health platform refers to a unified information infrastructure—often called an "infostructure"—that supports various digital health applications. This infrastructure comprises a set of reusable components to ensure interoperability, allowing digital tools like electronic health records, supply chain systems, and patient engagement applications to work together seamlessly.

**Slide 13:** Here is an outline of digital platforms and application categories commonly used in health systems today. Take a moment to review the list and mark the ones you are already familiar with. You may want to search for additional information on any unfamiliar tools.

**Slide 14:** Now, let’s focus on Electronic Medical Records (EMRs) and Electronic Health Records (EHRs). Though these terms are often used interchangeably, they differ. EMRs are digital versions of paper-based patient records used within a clinician's office or hospital, while EHRs are designed to facilitate sharing of information across multiple healthcare providers and organizations, improving diagnosis, treatment plans, and overall quality of care.

**Slide 15:** To summarise the key components of electronic health records, we have:

1. Patient health data
2. Order entry systems for electronic orders of tests and treatments
3. Decision support systems, offering evidence-based recommendations
4. Security protocols to ensure patient confidentiality
5. Communication tools for coordination among healthcare providers

**Slide 16:** The benefits of a well-designed digital health platform are vast. These include improvements in care quality, efficiency, affordability, and adherence to clinical guidelines. Furthermore, health policy-making and resource allocation can become more effective due to the availability of high-quality data.

**Slide 17:** Let’s revisit the health system building blocks and reflect on the role digital technology plays in each of them. Particularly, studies suggest that digital solutions can enhance health workforce competencies. You can explore more by reviewing the referenced meta-analysis.

**Slide 18:** However, it’s important to acknowledge the challenges of digital transformation in health systems. These include concerns over personal data privacy, increased workload for healthcare workers, and the financial strain of building a national digital infrastructure.

**Slide 19:** What are the other challenges you think may accompany digital healthcare transformation? Feel free to conduct a literature review to explore this further.

**Slide 20:** Next, we will discuss ways to measure health system performance.

**Slide 21:** In this context, it’s important to distinguish between the often-confused concepts of effectiveness, efficacy, and efficiency. Effectiveness examines how well a health system achieves its goals under real-world conditions, reflecting practical application. In contrast, efficacy considers performance under ideal, controlled circumstances, offering a benchmark for potential success. Efficiency focuses on the relationship between inputs and outputs, ensuring that resources are utilized to achieve the best possible results.

**Slide 22:** When evaluating efficiency, two specific types are particularly relevant. Technical efficiency assesses whether a system achieves a given output with the least possible input, focusing on minimizing waste. Allocative efficiency, on the other hand, ensures that resources are directed toward producing the optimal mix of health outcomes, balancing costs and benefits for maximum societal impact.

**Slide 23:** To clarify, inputs refer to the quantity and quality of a health system’s building blocks, while outputs are the services provided to achieve the system's objectives.

**Slide 24:** In closing, consider the improvements you’ve seen in health systems over the past decade. What do you believe are the key sources of inefficiency in modern health systems? We invite you to reflect on these aspects.

**Slide 25:** In the upcoming section of this learning block, we will explore potential answers to these questions by highlighting opportunities for improvement within health systems, using a case-based approach to bring practical insights into the discussion.

**Slide 26:** Our case involves a 69-year-old male patient with a five-year history of Type 2 Diabetes Mellitus and arterial hypertension. A month ago, he suffered an Acute Myocardial Infarction and underwent a percutaneous coronary intervention, commonly known as angioplasty with stent implantation. He lives in an urban area near the tertiary hospital where he was discharged. His medical regimen includes dual antiplatelet therapy with low-dose aspirin and ticagrelor, designed to reduce the risk of another heart attack.

**Slide 27:** To provide some context, one of the key challenges in Cardiology is balancing thrombotic and bleeding risks, especially after an acute myocardial infarction. Interrupting dual antiplatelet therapy during the first three months poses a high risk of another cardiovascular event, while continuing it increases the risk of bleeding. This balance is especially crucial if the patient requires surgery.

**Slide 28:** One month after the myocardial infarction, while at home, the patient experiences haematuria – visible blood in his urine – and is examined at the Urology emergency department of a different tertiary hospital. He is diagnosed with bladder cancer, which requires time-sensitive surgery. The urologists advise him to consult his cardiologist to stop both antiplatelets before the surgery, recommending the use of low-molecular-weight heparin injections as a substitute to minimize bleeding risk.

**Slide 29:** The patient faces several obstacles in reaching his cardiologist. Despite multiple phone calls, the lines are either busy or unresponsive. His limited digital literacy further complicates efforts to schedule an appointment online. Eventually, when he makes contact by phone, he is told to call back on the first of the next month, 18 days away, as this is when new appointments are opened. He is also warned about long waiting lists.

**Slide 30:** Frustrated, the patient decides to visit the cardiology clinic in person. After waiting for several hours, he finally sees his cardiologist, who informs him that stopping both antiplatelets is risky, as low-molecular-weight heparin is not an appropriate substitute. The cardiologist advises the patient to have the urologist contact him directly for a collaborative decision and provides a referral letter. Despite understanding the instructions, the patient is left feeling frustrated and confused by conflicting opinions.

**Slide 31:** Before moving forward, we invite you to reflect: How common are scenarios like this in modern health systems? Which weaknesses of the health system are revealed by this case?

**Slide 32:** The case we’ve presented highlights a significant issue in contemporary healthcare: fragmentation of care. This refers to the disconnection between healthcare providers, which contrasts with the cohesion needed between the different building blocks of the health system. Fragmentation often increases as the number of healthcare organizations and specialties involved grows.

**Slide 33:** Patients with multiple chronic conditions, like our case patient, are particularly vulnerable to the negative impacts of fragmented care. Coordinating their treatment becomes complex due to numerous clinicians, appointments, and referrals, leading to duplicate services and inefficiencies in the highly specialized health system.

**Slide 34:** There is substantial evidence linking fragmented care to poor outcomes, such as economic inefficiency, health inequality, depersonalization of patients, and more frequent hospitalizations. Fragmentation has also been associated with inappropriate medication use and increased mortality.

**Slide 35:** A paradox exists in that overspecialization – a product of scientific progress – is a key driver of fragmented care. It leads to an imbalance between specialists and generalists, narrowing the scope of knowledge. In the presented case, the negative effects of overspecialization are evident in the lack of coordinated care between cardiology and urology.

**Slide 36:** Returning to our patient’s case, clinical guidelines recommend avoiding the interruption of aspirin – and ideally ticagrelor – unless the surgical bleeding risk is unacceptably high. The urologist’s judgment is critical and must be effectively communicated. Eventually, inter-specialty agreement is reached, with the decision to stop dual antiplatelet therapy five days before surgery and admit the patient for intravenous cangrelor infusion. However, a new issue arises when the urology nurses refuse to administer cangrelor, citing inexperience, leading to tension between departments.

**Slide 37:** This case brings us to the broader issue of interprofessional conflicts within healthcare systems. Contributing factors include organisational complexity, unclear role expectations, competition over resources, and personality differences. Such conflicts can hinder effective care delivery.

**Slide 38:** What has been your experience with interprofessional collaboration in healthcare? You may perform a web search or literature review on strategies to improve collaboration between healthcare professionals.

**Slide 39:** So, what can be done to enhance interprofessional collaboration in healthcare? According to a Cochrane review, strategies such as interprofessional action planning, joint rounds, and the use of checklists have shown some evidence of improving patient outcomes and resource utilization. While these strategies may not be a cure-all, they offer steps toward improved collaboration.

**Slide 40:** As we approach the end of this learning unit, we will now focus on how digital solutions can help improve interdisciplinary collaboration within health systems.

**Slide 41:** Collaboration between nurses and physicians is the most widely studied interprofessional relationship in healthcare. Research suggests that interprofessional bedside rounding improves teamwork, patient care, and satisfaction. However, logistical barriers often prevent their implementation. Here, digital technologies, such as mobile applications, have been proposed as solutions, reducing wait times and improving communication between nurses and physicians.

**Slide 42:** A referenced study evaluated the use of a mobile application to enhance physician-nurse collaboration. The app, which enabled secure messaging and telephony, increased interprofessional bedside rounds by over 20% within 16 months, demonstrating the potential of digital tools to bridge coordination gaps.

**Slide 43:** In the case we presented earlier, how could digital technology be used to resolve the collaboration issues that emerged? Consider how these tools could streamline communication between different healthcare professionals.

**Slide 44:** In conclusion, this module emphasises how care fragmentation affects patient outcomes, particularly in complex cases. Enhancing communication, collaboration, and using digital tools can reduce inefficiencies, improve patient safety, and foster more cohesive care. Addressing these issues is essential to improving modern healthcare outcomes.

**Slide 45:** Here, you will find references to the literature on which this content has been based, as well as useful links to web pages where you can explore the topics covered in more detail.

**Slide 46:** Thank you for your attention! We hope this learning unit has provided you with valuable insights into the structure, challenges, and opportunities for improvement in contemporary health systems.