FEASIBILITY STUDY ON HEALTH WORKFORCE SKILLS ASSESSMENT

Supporting health workers achieve person-centred care

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Abbreviations and acronyms

ACFD	Association of Canadian Faculties of Dentistry
CanMEDS	Framework developed by the Royal College of Physicians and Surgeons of Canada that identifies and describes the abilities physicians require to effectively meet the health care needs of the people they serve
CEDEFOP	European Centre for the Development of Vocational Training
CHW	Community Health Worker
COPDEND	Committee of Postgraduate Dental Deans and Directors UK
CPD	Continuous Professional Development
CPME	Standing Committee of European Doctors
EFN	European Federation of Nurses Associations
ESNO	European Specialist Nurses Organisations
FIP	International Pharmaceutical Federation
GP	General Practitioner
ICN	International Council of Nurses
ICT	Information and Communication Technology
ILO	International Labour Organisation
NAM	National Academy of Medicine (USA)
PIAAC	OECD Programme for International Assessment of Adult Competencies
PGEU	Pharmaceutical Group of the European Union
RN4CAST	Nurse Forecasting in Europe Research Programme
TALIS	OECD Teaching and Learning International Survey
UEMS	European Union of Medical Specialists
WFME	World Federation of Medical Education
WHO	World Health Organization

Glossary

Adaptive problem solving	Adaptive problem solving refers to an individuals' capacity to flexibly and dynamically adapt their problem solving strategies to the environment in which they operate, identify and select among a range of available resources, highlighting the centrality of a reflexive, flexible, and adaptive mind. Adaptive problem solving takes place at the interface between the internal, mental world of the problem solver and the external world that makes information available in the physical, social, and digital environment that can be used as problem solving resources.
Health Associate Professionals	(ISCO-8 Group 32, excluding veterinarians) perform technical and practical tasks to support diagnosis and treatment of illness, disease, injuries and impairments in humans and animals, and to support implementation of health care, treatment and referral plans usually established by medical, veterinary, nursing and other health professionals. Tasks performed by workers in the sub-major group usually include: testing and operating medical imaging equipment and administering radiation therapy; performing clinical tests on specimens of bodily fluids and tissues; preparing medications and other pharmaceutical compounds under the guidance of pharmacists; designing, fitting, servicing and repairing medical and dental devices and appliances; providing nursing and personal care and midwifery support services; using herbal and other therapies based on theories, beliefs and experiences originating in specific cultures.
Health Professionals	This category of workers (ISCO-8 Group 22, excluding veterinarians) conduct research; improve or develop concepts, theories and operational methods; and apply scientific knowledge relating to medicine, nursing, dentistry, pharmacy, and promotion of health. Competent performance in most occupations in this sub-major group requires skills at the fourth ISCO skill level.
Patient-centred care	Provision of care that is "respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions." (IOM 2001)

People-centred care	People-centred health services are an approach to care that consciously adopts the perspectives of individuals, families and communities, and treats them as participants as well as beneficiaries of trusted health systems that respond to their needs and preferences in humane and holistic ways. People-centred care requires that people have the education and support they need to make decisions and participate in their own care, and is organized around the health needs and expectations of people rather than diseases. It extends beyond person-centred care in that it includes public health and population-based programmes. See WHO http://www.who.int/servicedeliverysafety/areas/people-centred-care/ipchs-what/en/
Person-centred care	Person-centred care is an approach to healthcare that offers personalised care customised to the particular health and social needs of the individual, and views the persons using health and social services as equal partners in planning, developing and monitoring care to make sure it meets their needs. This means putting the person and their families as integral members of the decision-making process, and seeing them as experts in their own right, working in partnership with the health professionals, to achieve the best experience and outcome for the individual.
Skills	In most of the literature as well as in policy-relevant work, knowledge, competencies, abilities, and, to a lesser extent, even education are often used interchangeably (OECD). In this report, the term "skill" is used to indicate all types and facets of competences needed by workers to perform their jobs. Distinctions between different dimensions are made only where relevant. This is done partly for the sake of simplicity but also because of a general lack of agreement on what each of these terms refers to. Indeed, although there are some conceptual differences between them, all terms refer to the interactions between workers and their jobs and relate to the same problematic of shortages and surpluses in the labour market, with similar methods applied to estimate their imbalances. Skills are generally a combination of ability, capacity and knowledge acquired through deliberate, systematic, and sustained efforts to carry out complex tasks or job functions. These can be grouped into cognitive skills (concepts, ideas), technical skills, and interpersonal skills. Skills can also be classified as job-specific or generic/transversal.

Skills Mismatch	Mismatch either refers to the inadequacy of a worker's skills relative to the requirements of the job he/she is currently in (e.g. having a lower level of qualification than generally required for the job, or being trained in a field of study other than the one generally required for the job), or to the opposite phenomenon whereby a worker's skills exceed those required by the job (e.g. having a higher level of qualification than generally required for the job). Mismatch can be measured relative to qualification level, field of study or skills.
Transversal Skills	Transversal skills and competences are relevant to a broad range of occupations and economic sectors. They are often referred to as core skills or "soft" skills and are the cornerstone for the personal development of a person, and are the building blocks for the development of the other job-specific skills and competences required to succeed on the labour market.

Table of contents

Tables

Figures

Boxes

Executive Summary

Many EU member states and other OECD countries are facing significant health system challenges from the increasing demand for healthcare in a fiscally constrained environment. These challenges emerge from many causes: the rising proportion of ageing citizens with multiple chronic conditions and complex social situations, rapid diffusion of new technologies and increasing complexity of care, and ever more stringent financial constraints. In response, many OECD governments are calling for major reforms in the health system toward more integrated and personalised forms of care. Health workers find themselves at the centre of these converging forces that demand the delivery of high quality care with ever greater flexibility, efficacy and efficiency in an increasingly complex and changing environment.

These pressures are placing enormous strains on the health workforce. This is evident, for example, in the increasing rate of "burn-out" (Dyrbye, et al., 2017) among different categories of health professionals, which could negatively affect their ability to provide safe and effective care for patients. Burn-out also contributes to attrition, exacerbating human resource shortages. Another manifestation of the strain on the workforce is the high rates of skills mismatch reported by doctors and nurses in comparison to other professional workers (Schoenstein, Ono, & LaFortune, 2016). These findings have raised deep concerns among health policy makers about both the capacity of health workers to meet these demands, and the urgent need to identify appropriate policy interventions that will enable health workers to meet these challenges.

Objectives

This study reviews the status of existing surveys that measure health professional skills, and identifies gaps where more attention and resources will be needed to generate policy-relevant evidence on skills requirements, skills use and skills mismatch in healthcare settings. Furthermore, the study explores the feasibility of developing a standardised approach to analyse these gaps and allow international comparability, taking into account the diversity of health care systems, and comparability across different categories of health professionals.

Findings

Increasingly, health care professionals need to apply adaptive problem-solving skills to respond to complex and non-routine patient care issues, while working in complex, multi-disciplinary and frequently stressful occupational environments. In the coming years, countries will need *resilient and flexible* health workers who are armed not only with technical and clinical skills, but with cognitive, self-awareness and social skills that will enable them to monitor and assess the situation, make

decisions, take a leadership role, and communicate and co-ordinate their actions within a team in order to achieve high levels of patient safety and efficiency, as well as to assure their own safety and job satisfaction.

Segmentation of health professional skills assessment. A large set of skills assessment instruments exists to measure specialised and technical skills of different categories of health professionals; however, these assessment tools are predominantly developed and used by health professional associations and professional regulatory bodies for licensing and certification purposes. For this reason, they are generally designed to measure the qualification of a specific health professional group and focused on a particular aspect of healthcare performance, and hence do not lend themselves easily to system-wide assessments of skills across all categories of health professionals. At the other end of the spectrum, more generalised skills assessment surveys such as OECD's Programme for International Assessment of Adult Competencies (PIAAC) are designed for the entire adult population and offer internationally standardised approaches to skills assessment, but they are too broad for probing into sector-specific issues.

Convergence of transversal skills. Despite the segmented nature of the skills assessment landscape, we find a remarkable convergence of the types of skills that are recognised as important across different categories of health professionals from different countries. These cross-cutting skills include *interpersonal skills*, such as communication, teamwork, self-awareness and openness to continuous learning, and *analytical skills* such as adaptive problem-solving skills to devise customised care for individual persons and the ability to use ICT effectively. These *transversal skills* originate in the workplace reality for health professionals managing increasingly complex tasks, such as actively engaging individuals in their own care management and health maintenance, while working in an occupational context that requires the professionals' on-going adaptation to advances in technology and changes in professional standards. The emerging convergence across professions of these transversal skills points to the feasibility of developing a skills assessment instrument that could be applied to all categories of health professionals and across different health systems.

Need for a systems-relevant approach. The existing skills assessment instruments do not readily enable differentiations to be made between the skills mismatch caused, on the one hand, by the inadequacies of the education and training system or, on the other hand, by the inadequacies or competing pressures in the health system. Such distinctions are necessary for policy makers to determine the appropriate course of action, for example, whether to focus resources on reforming the education and training of health professionals or to focus on addressing system constraints that prevent the workers from applying their skills. (Such constraints might include for instance, misalignment in payment incentives; restrictions due to regulations; or shortcomings in the organisation and management of the work process.)

Need to integrate person-centred perspectives. Since most of the existing skills assessment instruments have been developed from the perspective of the healthcare provider, they are generally not designed specifically to reflect the perspectives of the individuals receiving care. To deliver seamless personalised care, healthcare teams will need to be responsive to the varying needs of individuals across variable states of health, socio-cultural backgrounds and personal characteristics, such as developmental stages of life. These individuals will present with diverse care needs,

ranging from healthy persons seeking support for healthy lifestyles to acute and chronic care patients dealing with the consequences of illness or injury, and those from disadvantaged and marginalized backgrounds requiring socio-culturally sensitive care. To be policy relevant, future health professional skills assessment instruments will need to incorporate the perspectives of the persons receiving care, and be able to measure the professionals' ability to cope with the consequences of this paradigmatic shift in the approach to delivering healthcare services.

Recommendations

Although a large number of skills assessment instruments already exist in the health sector, there is considerable scope for improving the effectiveness of health professional skills assessment surveys to generate policy-relevant and actionable evidence.

- Skills assessment instruments should be developed around policy-relevant issues identified through active participation not only of interprofessional groups but also of patient representatives, health policy makers and other stakeholders (such as payer representatives). These issues can be incorporated into the questionnaires in the form of scenarios or vignettes which are locally adapted and reflect real-life cases likely to be faced by the health professionals and patients.

- Skills assessment questions can be organised around a number of transversal skills that are recognised as relevant for all health professionals, such as teamwork, communication, socio-cultural sensitivity, awareness of professional and ethical standards, workers' own safety and well-being, and adaptive problem solving. Depending on the priorities of each country, the assessment instrument could include all of these skill sets or a specific selection.

- Self-reported questionnaires are the most cost-effective instrument. Their value can be enhanced by including not only questions about self-assessment of skills but also the actual use of particular skills at the workplace and the worker's attitude toward the task involving the particular skill. Direct assessment instruments are more costly to develop and administer, but can add value if they are designed to address critical skills that are difficult to evaluate using a self-reporting questionnaire, such as team effectiveness and adaptive problem solving.

- The choice of sampling frame will be instrumental in relating the findings of the skills assessment instruments to other health sector performance measures, such as hospital surveys or patient surveys. By choosing an appropriate sampling framework, the results of the skills surveys could be correlated with the outcomes of other healthcare surveys, which will significantly increase the relevance of their respective findings. Countries will need to determine whether the benefits of introducing a more complex sampling framework are worth the higher cost of designing and implementing this approach.

- The policy relevance and usefulness of the skills assessment survey will be enhanced significantly by involving key stakeholders, including

representatives of patient groups, professional associations, managers and policy makers. Stakeholders could be involved in the design of the questionnaires and the identification of policy and practice relevant hypotheses to be tested by the survey. Diverse stakeholder involvement will help to enrich the content of the survey, as well as encourage greater collaboration and ownership among the stakeholders in finding appropriate solutions to these challenges.

1. Introduction

1.1. Background

 The landscape of health services delivery is undergoing significant transformation from a disease-centred clinical care delivery approach toward value-based and personalised models of care. Many EU member states and other OECD countries are facing significant health workforce challenges because of the rising demand for and growing complexity of healthcare due to ageing populations with multiple chronic conditions in a global context of rapid diffusion of new technologies. These new demands are leading to major reforms in care models and commensurate changes in the skill-set required by health workers.

There is real risk that this transformation will result in a skills mismatch among health care professionals, which will intensify because the pace of innovation and reforms in health systems are expected to increase globally. A recent OECD study (Schoenstein M, 2015) found relatively high levels of skills mismatch among health professionals, pointing to a potentially critical weakness in the current health systems in member states. This was highlighted at the OECD Health Ministerial Meeting held in January 2017 which called for "a transformative agenda for the health workforce, assessing health professional skills, remuneration and co-ordination, and how these skills and models of care need to adapt in light of digitalisation, wider technological changes, and the evolution of patients' needs."

At the European level, the European Commission's Joint Action on Health Workforce Planning and Forecasting (Joint Action Health Workforce Planning and Forecasting, 2016) highlighted these drivers of change in the health sector and the need for new skills and competencies among health workers. At the global level, the UN Secretary General called upon ILO, OECD and WHO to prepare a joint programme "Working for health: Five-year action plan for health employment and inclusive economic growth (2017 – 2021)"[1] to support member states to accelerate progress towards Universal Health Coverage as part of the 2030 Agenda for Sustainable Development. The joint programme aims to support countries to develop national health workforce policies and strategies to enable all health workers to meet their full potential, applying skills that match the evolving healthcare needs of populations.

In summary , these findings have raised deep concerns among policy makers, motivating the search for a more in-depth understanding of the skills of health workers, and the context in which workers are using their skills to achieve the transformative agenda for improved health system outcomes.

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[1] The joint ILO/OECD/WHO Action Plan was adopted by the seventieth World Health Assembly in May 2017 (WHA 70.6).

1.2. Objective

The objective of this study[2] is to examine the feasibility of conducting a healthcare sector-specific survey of the skills of health professionals that will provide policy-relevant evidence on skills requirements, skills use and skills mismatch in workplaces.

Specifically, we examine the feasibility of developing a skills assessment approach that will allow international comparability while taking into account the diversity of health care systems and the variability of the roles and functions played by the different categories of healthcare workers. The proposed approach also considers the possibility of including new types of healthcare workers in response to new technologies, new models of care and the changing needs and expectations of the population.

To this end, we have reviewed the status of existing skills assessment surveys and data sources in the EU and in selected OECD countries, and identify areas requiring further development whilst building on the experiences from a variety of existing skills assessment instruments. Based on these considerations, we propose possible topics and contents areas (modules and questions), different methodologies and approaches to the survey in terms of the choice of instruments, sampling frame and administration of the survey, and discuss the potential benefits and costs of implementing these various options.

1.3. Methodology

Identification of priority policy concerns

We undertook extensive consultations with key stakeholders and subject experts to identify the priority policy questions and the types of information required in terms of the skills requirements for different categories of health professionals. These consultations included a series of expert working group and stakeholder meetings (see Annex 1.1), and in-depth key informant interviews with selected stakeholders representing professional groups, patient groups, healthcare managers, government policy makers, and academic researchers (see Annex 1.2).

Review of competency frameworks and survey instruments

We reviewed the existing data sources, including international surveys and profession-specific surveys, and identified the priority skills shared across all categories of the health professionals. Based on these reviews, we propose a general competency framework and a set of transversal skills that have been identified as areas of converging interests based on this review of existing survey instruments, and confirmed as areas of priority concern by the consulted stakeholders.

Options for the design of health sector-specific skills survey

We compared the different survey instruments and analytical approaches that have been used in existing skills assessment surveys in the health sector. In addition, we reviewed in some detail the experiences and instruments developed under OECD's

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[2] This feasibility study is being funded by the European Commission under EC Grant # 2015 5302.

Programme for International Assessment of Adult Competencies (PIAAC) for the general labour market, as well as another sector-specific skills assessment represented by OECD's Teaching and Learning International Survey (TALIS). We propose possible content areas (types of services, professional categories, domains of competence) and instruments (e.g., direct and indirect assessment tools) that could be included in a new survey of health workforce skills, and discuss various options for implementation in terms of design, testing and administration.

Next steps towards implementation

Finally, we propose the next steps for taking the findings of the feasibility study towards implementation at national and international levels. We discuss the feasibility of conducting the surveys and propose various options to meet the different needs and capacities at the country level. This will involve interested countries to conduct the skills assessment survey on a pilot basis, adapted to the local needs and context while maintaining common standards and comparable measures.

2. Defining the Skills Challenges

This section will review the drivers for change in the general labour market and the health sector in particular in order to identify the changing scope and nature of jobs, and the implications for the skills required by workers to function effectively in this dynamic and evolving context.

2.1. Drivers for change in the general labour market

European studies on the labour market find that job growth in the future is expected to be in the service sector and particularly in occupations related to the health care services (Cedefop, 2012). These studies consistently point to the importance of creativity, emotional intelligence and transversal skills to enhance team performance: hence, the importance of relevant skills assessment tools that will identify shortcomings and incentivize the system to foster these skills.

At the same time, robotic devices, information and communication technology (ICT) and other aspects of the digital revolution are becoming an integral part of the health care delivery system. The existing workforce needs to be trained and prepared through effective adult training and continuing education programmes to be ready to meet these changing work requirements.

The future economy will require workers with skills such as complex problem solving, critical thinking, judgment and decision-making, and active learning and instructing. More generally, literature on the employment sector (Michaels, Natraj, & Reene, 2014) describes how the expanding application of digital technologies is replacing workers who perform routine tasks, while there is an increasing demand for both interpersonal and analytical skills in jobs that involve non-routine, complex tasks (see Figure 1).

Figure 1 - Index of Changing Work Tasks in the U.S. Economy 1960-2009
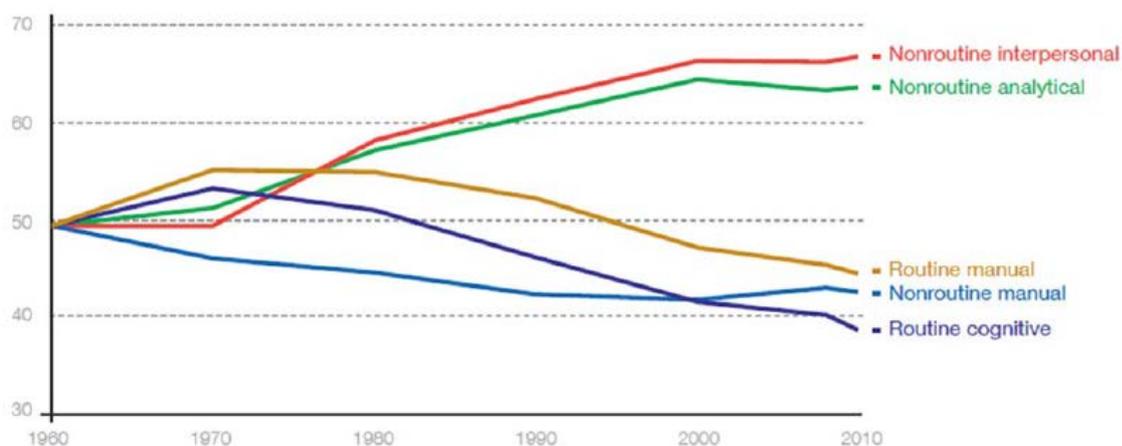
Source: Figure 6 in (OECD, 2016b)

Table 1 (below) shows the representative skill requirements in new and emerging occupations in high growth industries, further illustrating that new jobs often require complex problem-solving skills, high-level technical skills, or a broad range of social skills such as management, instruction, and service skills.

Table 1 - Examples of skills required in New and Emerging occupations

Skill	Description	Skill	Description
Complex Problem Solving	Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.	Programming	Writing computer programs for various purposes.
Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.	Social Perceptiveness	Being aware of others' reactions and understanding why they react as they do.
Active Learning	Understanding the implications of new information for both current and future problem-solving and decision-making.	Management of Personnel Resources	Motivating, developing, and directing people as they work, identifying the best people for the job.
Judgment and Decision Making	Considering the relative costs and benefits of potential actions to choose the most appropriate one.	Service Orientation	Actively looking for ways to help people.
Instructing	Teaching others how to do something.	Systems Evaluation	Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Source: O*NET, https://www.onetcenter.org/supplemental.html.

Jobs requiring more intensive ICT use also require a range of technical, professional and other occupation-specific skills, a solid level of information-processing skills (e.g. literacy and numeracy), as well as the ability to collaborate, share information, speak to groups, provide advice, work autonomously, manage, influence and solve problems (OECD, 2015). As technology automates certain tasks, the value of skills needed for non-automatable tasks, such as social skills, also increases (Autor, 2015).

OECD research on the general labour market has shown that since 1980 occupations requiring strong social and interpersonal skills and non-routine (complex) analytical skills have grown significantly with consistent wage growth and most occupations in healthcare sector are found within this category (OECD, 2017a).

2.2. Drivers of change in the health sector

Most European and OECD countries are undergoing demographic shifts, which alter the key areas of demand in national healthcare systems. Population ageing drives demand for specialised skills in how to treat chronic illnesses and other age-related health conditions. This shift in focus of healthcare, with greater emphasis on personalised medicine and more preventative actions, such as health counselling,

health promotion and patient empowerment, is rapidly changing the skills required by the healthcare professionals. Health workers are also increasingly expected to possess skills such as adaptability to new technologies, pro-active engagement in continuous learning processes; and ability to communicate complex information with a diverse range of individuals (i.e. immigrants as both patients and co-workers); and work effectively in a team setting.

Person-centred care in the form of personalised treatment presents an increasingly important trend of delivery of clinical diagnosis and provision of medical advice. The use of digital tools is being introduced to serve a greater number of elderly and other patient groups as well as persons living in remote areas. New forms of communication such as engaging patients through telephone communications or via online platforms are also gaining importance.

Other applications of technological advancements are expanding the potential capacity of health professionals in clinical decision-making and advance care delivery. The expansion of gene-based medicine, information technology and e-health is leading to new ways of care delivery, for example, a medical doctor or a radiologist could potentially reach the diagnosis more quickly and with greater accuracy by using an ICT system that can draw intelligence from an ever expanding number of data sources (see Box 1). The increasing use of IT is also correlated with increasing sharing of information and collaboration across teams, which brings obvious benefits but also risks of information overload, data loss and miscommunication.

Box 1 – Expanding application of e-health and telehealth

"Telehealth solutions help meet the Danish healthcare system's demographic challenges with ageing citizens and patients with chronic disorders. An increasing number of solutions are developed and designed to make it possible for patients to be discharged to their own home, even though they still require treatment, monitoring, or rehabilitation.

"Numerous patient groups experience significant advantages from being closely monitored while they are in their own home. Patients often feel more secure at home and do not have to commute to and from outpatient departments.

Telehealth solutions not only benefit the patients in terms of avoiding unnecessary transportation – they are also cost-efficient for the society as a whole. Effective collaboration between municipalities and medical professionals and experts brought in from hospitals, ensures that patients receive better treatment with both faster and better outcomes.

Videoconferencing and home monitoring of patients offer a good supplement to physical consultations with caregivers, and online tools for rehabilitation are increasingly being implemented to prevent readmissions. Online dialogue-based tools provide caregivers in the municipalities with the ability to tailor rehabilitation programs for their patients. The results from the rehabilitation programs are available online, and the caregiver can assess the data and adjust the exercises if needed".

Source: (Healthcare Denmark, 2017)

The level of risk and complexity of tasks will also increase with the expansion of personalised care which demands greater attention to social determinants and other aspects of patients' lives that could impinge on legal boundaries with ethical considerations. The stress of confronting moral and ethical issues in the workplace contributes to workplace conflict and attrition (Ulrich, et al., 2010; Levi, Thomas, Green, Rentmeester, & Ceneviva, 2004). Reinforcement of ethical judgement and risk management skills will be another area required by the health professionals.

The health workforce of the 21st century will need to be organised and capable of responding to the diverse needs of individual persons at different points in time, across variable states of health, and throughout progressive stages of life. These transformations in the care delivery system will call for commensurate investments in skilling up the health workforce to deliver person-centred care, which will involve coordinating complex tasks in multi-disciplinary team settings and undertaking a more comprehensive assessment of what happens to patients across the pathway of care and outside traditional healthcare settings.

In response to the changes in the healthcare system, evidence from recent studies (de Bont A & Team, 2016) on European countries finds that health professional roles are becoming increasingly diverse. Specialised skills for well-specified technical and clinical tasks remain important and are the domain of skills assessment instruments used by professional associations and professional regulatory bodies. Increasingly, however, there is recognition of the importance of generic tasks shared across all categories of health workers that focus on organising, communicating and integrating care (Braithwaite, et al., 2012; Braithwaite & Lamprell, 2013).

2.3. Evidence of strain on the health workers

Many EU and OECD governments are calling for major reforms in the health system toward more integrated and personalised forms of care. Health workers find themselves at the centre of these converging forces that demand the delivery of high quality care with ever greater flexibility, efficacy and efficiency in an increasingly complex and changing environment. These pressures are placing enormous strains on the health workforce, and are evident in the increasing rate of "burn-out" among different categories of health workers (Dyrbye, et al., 2017). These conditions negatively affect the health workers' ability to provide safe and effective care for the patients, and contribute to high attrition rates among the healthcare professionals.

Another manifestation of the strain on the workforce is the high rates of skills mismatch reported by doctors and nurses in comparison to other professional workers (Schoenstein M, 2015). These findings have raised deep concerns among the health policy makers about the capacity of the health workers to meet the changing demands for care, and the urgent need to identify appropriate policy interventions that will better support and enable health workers meet these challenges. An OECD study (Schoenstein, Ono, & LaFortune, 2016) reported on the results from the 2011/2012 OECD Programme for the International Assessment of Adult Competencies (PIAAC), which revealed the extent of skills mismatch among nurses and doctors in OECD and EU countries.

Figure 2 - Likelihood of reporting being over-skilled or under-skilled by occupation groups, PIAAC 2011-12
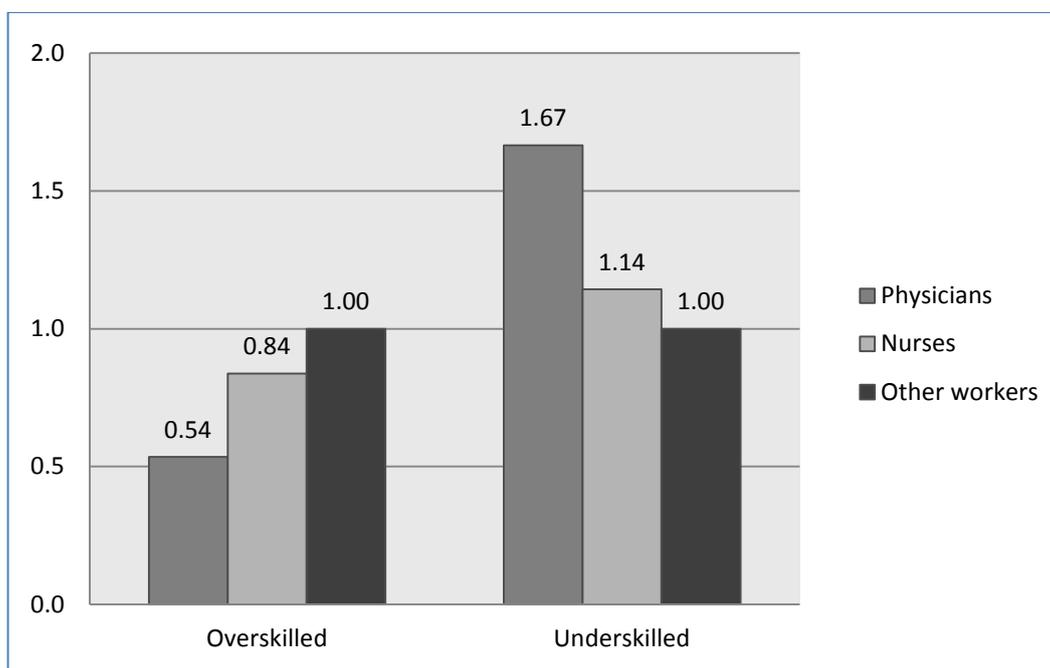
Source: Figure 6.6 in OECD 2015 Health Workforce Study (Schoenstein, Ono, & LaFortune, 2016).

PIAAC results showed that some 76 percent of doctors and 79 percent of nurses reported over-skilling in their current job, while 51 percent of doctors and 46 percent of nurses reported under-skilling. In comparison to other professionals, doctors and nurses reported somewhat less mismatch in over-skilling compared with other professionals, but doctors were 67 percent more likely, and nurses 14 percent more likely to report being under-skilled for their duties compared to other professionals. When stratified by education levels, it becomes evident that advanced nurses (master's level or above) face a very high level of over-skilling – nearly twice the level of other professionals.

The PIAAC 2011/2012 survey allowed the respondents the option of reporting simultaneously on over-skilling and under-skilling for the same job. From the aggregate data, it is evident that many workers reported being both under-skilled and over-skilled within the same job, presumably for different aspects of their work.

Figure 3 - Likelihood of reporting being over-skilled and under-skilled by nurses by levels of education, PIAAC 2011/2012
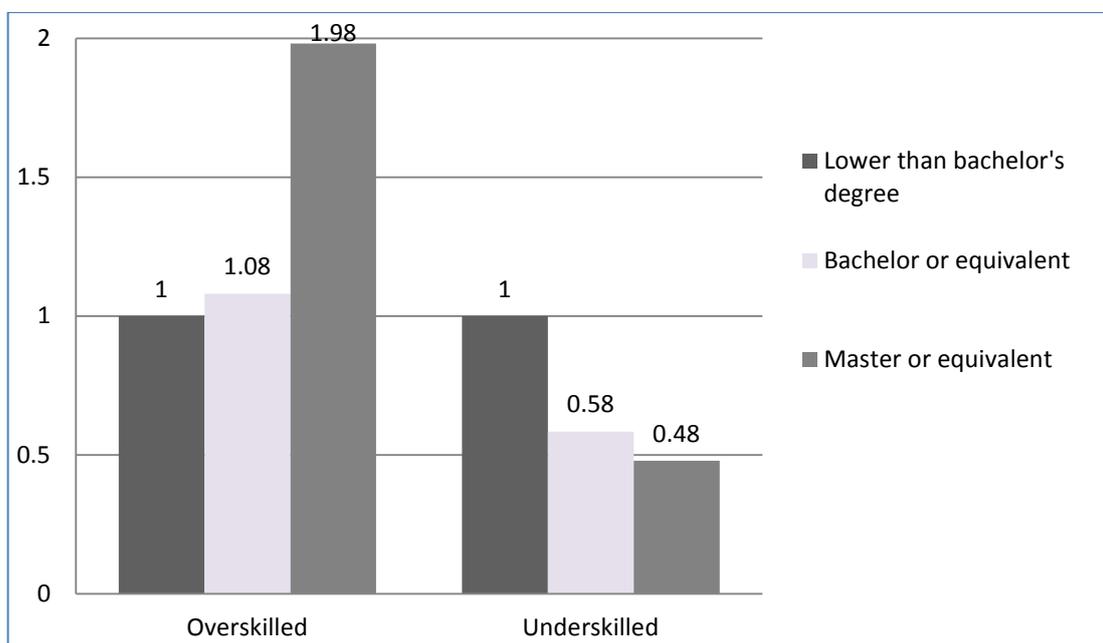
Source: Figure 6.9 in OECD 2015 Health Workforce Study (Schoenstein, Ono, & LaFortune, 2016) http://dx.doi.org/10.1787/9789264239517-graph62-en

In addition to skills mismatch, the PIAAC study included a module on skills use, which applied an innovative "job-requirements approach" to determine the number of generic skills they use in the workplace. This survey asks the workers how intensively and how frequently they use these generic work skills: (i) cognitive skills including reading, writing, mathematics and the use of information and communication technologies; (ii) interaction and social skills; (iii) physical skills including dexterity; and (iv) learning skills. The PIACC survey findings for physicians, nurses and other category of workers are summarized in Figure 4.

The PIAAC skills use module begins to identify the range of skills used by the workers on the job. However, because the PIACC survey was designed to cover all categories of workers, it did not specify which job-specific functions are associated with these generic skills, or to identify which of the generic skills are associated with the reported over-skilling and under-skilling. Such detailed identification of job-specific functions will require sector-specific survey design. Finally, it should be noted that the PIAAC survey did not have a sufficient sample size of physicians and nurses to allow comparisons to be made across countries.

Figure 4 - Reported skills use by physicians, nurses and other occupations, PIAAC, 2011-12
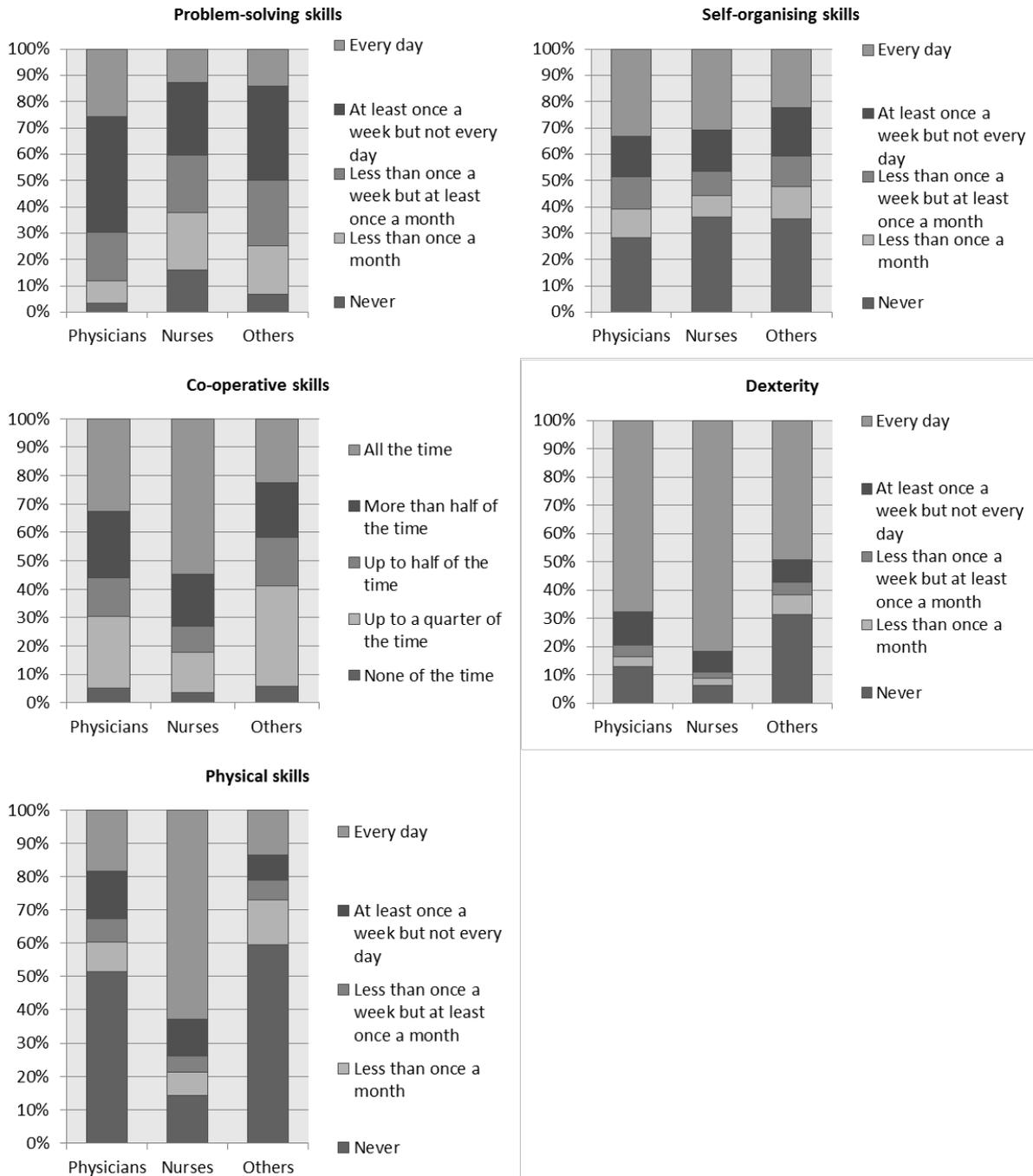
Source: Figure 6.5 in (Schoenstein, Ono, & LaFortune, 2016)

Another example of an international skills survey is the 2013 European Nursing Survey (RN4CAST), which was designed to offer more specific insights on the types of functions in which nurses reported over-skilling. The RN4CAST survey, covering about 33 000 nurses working in 486 hospitals in 12 EU countries, collected information on nurses performing tasks below their skill level, which included delivering and retrieving food trays, transporting patients within the hospital, cleaning patient rooms and equipment, and obtaining supplies or equipment. In every country, at least three of the nine tasks deemed to be below their skill level were carried out by at least 70 percent of nurses who responded to the survey (Bruyneel, et al., 2013). Thus, the RN4CAST survey is an example of a purposive and specialty-specific survey designed to determine the specific tasks associated with over-skilling.

3. Review of competency frameworks and skills surveys

The proposed skills assessment survey is aimed at health professionals and health associate professionals who are working directly in patient care or are members of the team supporting these care providers. We reviewed health workforce skills frameworks and surveys existing in the EU and in selected OECD countries for different categories of health professionals, including doctors, nurses and pharmacists.

The challenging question is whether it would be possible to develop a generalizable competency framework encompassing the major professional groups within the health sector. As healthcare systems evolve, new roles and functions emerge so the use of competency frameworks and domains will likely become more important. But for relevant comparisons over the longer-term, frameworks will need to be both flexible enough to allow new categories of health workers to be included, and robust enough to define a common set of skills covering multiple functions and roles.

3.1. Definition of Competency and Skills

In the literature review, the terms "skills" and "competencies" are often used interchangeably. Skills and competencies both describe the functional capacity of the individual to perform in the workplace. In the context of Survey of Adult Skills OECD does not attempt to differentiate them, and we propose to follow the same convention (see Box 2, below).

In the education and employment sectors, it has become important to measure both cognitive and non-cognitive skills, and to identify and measure relevant competencies in the work environment. This is necessary for responding to the speed of technological change and organizational restructuring, and also because of the growing importance of cross-cutting cognitive and non-cognitive skills in a high-skilled and high technology service-based economy. Healthcare has been one of the sectors undergoing many intensive changes in this direction.

Non-cognitive skills refer to "patterns of thought, feelings and behaviour" of individuals that may continue to develop throughout their lives (Borghans, Duckworth, Heckman, & ter Weel, 2008). These skills include critical thinking, problem solving, emotional health, social behaviour, work ethic, and community responsibility. Also important are factors affecting personal relationships such as closeness, affection, and open communication, self-control, self-regulation, persistence, confidence, teamwork, organizational behaviour, creativity, and communication (Garcia, 2014).

Box 2 - Definition of Competency and Skills

> **Definition of Competency and Skills**
>
> A distinction is sometimes made between "competency" and "skill" in the literature on education and training. Competency is often presented as a capacity that can be applied to a relatively wide range of "real" contexts, while "skill" is considered a constituent unit of competency, that is, a specific capacity, often technical in nature, relevant to a specific context. For example, competency has been defined as "a combination of knowledge, skills and attitudes appropriate to the context" (European Commission, 2007). In the context of the Survey of Adult Skills (PIAAC), however, no attempt is made to differentiate competency and skill, and the terms are used interchangeably in this report.
>
> Both terms refer to the ability or capacity of an agent to act appropriately in a given situation. Both involve the application of knowledge (explicit and/or tacit), the use of tools, cognitive and practical strategies and routines, and both imply beliefs, dispositions and values (e.g. attitudes). In addition, neither competency nor skill is conceived as being related to any particular context of performance, nor is a skill regarded as one of the atomic units that combine to form competency. Skills (competencies) can always be broken down into smaller and more specific skills (or competencies) or aggregated into more general skills (or competencies).
>
> Source: Box 1.1 in (OECD, 2013)

Non-cognitive and cognitive skills are interdependent and cannot be isolated from one another. Employers stress the value of non-cognitive skills in the workplace, and evidence suggests that non-cognitive skills are associated with higher productivity and earnings. For example, the results of a 2006 survey of 400 employers in the USA about their expectations of new entrants with a four-year college degree indicate that the four most important skills are oral communication, teamwork/collaboration, professionalism/work ethic, and critical thinking/problem solving, with more than 90 percent of the employers surveyed declaring these skills to be "very important" (Casener-Lotto & Barrington, 2006). Employers also emphasize the importance of life-long learning and continuous development. Such evidence supports the value of measuring both the technical and cognitive skills, such as the knowledge and practice of clinical interventions, as well as skills such as team work and communication. Since competencies are observable, they can be measured and assessed to ensure their acquisition and use (Frank, Snell, & OT, 2010).

3.2. Whose skills are we measuring?

Before we proceed further, we will first need to clarify whose skills we are proposing to measure. The health sector-specific skills survey is aimed at "Health Professionals" and "Health Associate Professionals" who are working directly with patients and those supporting these care providers (see ISCO-8 classification, Glossary).

Health professionals comprise a wide range of sub-occupations, including general and specialised medical doctors, nursing and midwifery professionals, audiologists, physiotherapists, and other specialists responsible for providing consultative, diagnostic, and treatment services. Health associate professionals are responsible for carrying out a range of practical and technical activities to support diagnosis and treatment as well as preventive and rehabilitative services.

Table 2 - Occupations with the largest numbers of people employed in human health & social work activities in 2015 in EU

Occupational groups	Number employed
Health professionals	5,127,520
Health associate professionals	4,691,812
Personal care workers	5,112,752
Cleaners and helpers	1,456,891
Legal, social, cultural & related associate professionals	1,187,101

Source: Cedefop, 2017, Skills Panorama, *Health & social care*, http://skillspanorama.cedefop.europa.eu/en/sectors/health-social-care, retrieved on August 10, 2017.

In the EU countries, employment in health professionals and associated professionals rose by 12% over the last decade, and is expected to grow a further 10% by 2025. While personal care workers, cleaners and other occupational groups are also represented in the health sector, the proposed health-sector skills assessment survey would focus on the assessment of health professionals and associated professionals for a number of reasons. Firstly, this group of workers requires a relatively high cost of investment in terms of education and training as well as a high share of the country's wage bill. Moreover, we expect an increase in the labour market demand for this group of workers, yet at the same time we find a relatively high level misalignment of skills.

In the EU region, the majority of health associate professionals have held medium-level qualifications, but by 2025 a shift of balance is expected in qualification levels, as almost two thirds of these employees are expected to hold high-level qualifications. The trend towards higher qualifications can be attributed to the changing role of associate professionals in healthcare as they will continue to take on additional responsibilities from higher-level practitioners.

Shifts towards preventative and community-based healthcare are also changing the roles and functions of health professionals and associate professionals, who are increasingly expected to fulfil new roles that focus on the promotion of good health and the prevention of disease and injury. In a number of EU countries, public health practitioners, nurses and community care workers, have played a key role in improving patients' adherence to treatment regimes, knowledge of their conditions and self-management. This move towards preventative care requires expertise in social care as well as healthcare, so we may see an increasing convergence of functions and skills among these categories of workers. These changes in the expectations of both healthcare professionals and associate professionals will necessitate regular review of the subject focus of the skills assessment survey.

3.3. Review of competency frameworks for health professionals[3]

We undertook a literature review to collect and compare information on competency frameworks and skills surveys currently in place in selected countries for nursing and medical professionals. The review collected information on nursing and medical skills frameworks and surveys in EU and in selected OECD member countries (Australia, Canada, New Zealand). This review was supplemented by information collected from the International Pharmaceutical Federation (FIP) on the competency framework and skills requirements for pharmacists, and for dentists the work carried out by the Association of Canadian Faculties of Dentistry (ACFD) which proposes a new educational framework for the development of competency in dental programs (ACFD, 2016) and dental training curriculum prepared by the Committee of Postgraduate Dental Deans and Directors (COPDEND) UK (COPDEND, 2015)

Most of the competency frameworks are associated with the need to structure and guide the education and learning objectives of students, and are focused on ensuring graduates are fit to practise in their respective fields. Competency frameworks have become part of a new approach in education with emphasis on competency and life-long learning. In this way competency frameworks could become an important means of measuring health workers' progression and achievements through their career beyond initial qualification.

Since competency frameworks are generally produced or endorsed by professional regulatory bodies, there is an enforcement structure behind these frameworks. However, where there are multiple regulatory bodies in a country, there could also be a multiplicity of frameworks for each position. There are many country variations for the tasks and functions performed by different categories of health professionals. For example, nurses can prescribe medicines in only some of the countries. These variations make it difficult to compare all competencies across countries.

There has been a limited effort at establishing international frameworks and surveys for skills assessment in nursing and medicine. In part, this is due to the variations in practice noted above. In addition, the limited effort may reflect acknowledgement that nurses and doctors are regulated by national or sub-national (state and provincial) bodies, and therefore establishing a consensus on international competency norms and standards would be difficult to achieve. The initial efforts at the international level have focused on finding ways to develop common frameworks for education institutions. The World Federation of Medical Education (WFME) was one of the leaders in this respect by establishing a global competency framework for medicine.

While global competency frameworks for physicians do not exist yet, we find that already a number of efforts are underway to harmonize competency frameworks for physicians across several countries. The mobility of physicians across national borders is creating greater interest in developing a harmonized framework. Prior to developing national frameworks most countries conduct literature reviews of skills frameworks in other countries. The most influential and often used framework has been the CanMEDS framework from Canada. This may be a result of its clear

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[3] In the following sections, we will use the term health professionals to include both health professionals and health associate professionals.

structure and accessible, well-organised literature. Germany directly modelled its framework on the CanMEDS model, and CanMEDS has additionally influenced the Australian frameworks. The UK's "Good Medical Practice" and "Tomorrow's Doctors" approaches have also had significant influence. As a result of this cross-pollination of frameworks, the competency frameworks show increasing convergence, with the main differences being linguistic in nature.

More recently, following the example set by WFME, the International Pharmaceutical Federation (FIP) has launched an education initiative to develop a global competency framework and education strategy for pharmacists (International Pharmaceutical Federation, 2012). The FIP global competency framework takes a more expansive view of occupational domains, possibly reflecting the greater variability and range of tasks undertaken by pharmacists.

The International Council of Nurses (ICN) offers a set of guides on clinical interventions and International Classification of Nurses, but currently there is no global framework for nurse competences or nurse skills. Across countries, there tends to be greater multiplication of frameworks for nurses, possibly reflecting the diversity and changing scope of nursing practise. There are also regional frameworks available at the European level (European Federation of Nurses Associations, 2015; European Federation of Nurses Associations, 2017), as the European Union has regulations regarding basic training and competences for nurses to facilitate nurse mobility and qualification recognition among EU countries (Directive 2013/55/EU).

In the USA, the National Council for State Boards of Nursing is working toward greater harmonization of nursing regulations not only among the USA states, but across some provinces in Canada and states of Mexico. In addition to labour mobility, the introduction of telemedicine is spurring greater harmonization of nursing regulation across jurisdictions. These trends toward increasing coordination among countries and professional groups suggest that it may be feasible to achieve agreement on skills and competencies to be surveyed at an international level.

Competency frameworks define the roles of healthcare workers with clear functions and responsibilities within a defined scope of practise, implying the skills needed. These competency frameworks generally identify five to ten core skill sets or domains for their professional group, accompanied by a list of indicator skills as examples of performance in each domain. The skill sets that appear frequently across these frameworks include: management, communication, clinical competency, teamwork/collaboration, decision making, care coordination, medical documentation/IT skills, cultural competency, and research.

We found significant convergence of the skill sets recognized as important for the effective performance of tasks that could be applied across all categories of health professionals and associated professionals. These are mostly generic/transversal skills that fall under interpersonal skills, including communication, teamwork, leadership and socio-cultural sensitivity. These skill sets are also identified as the most important skills in the survey conducted by CEDEFOP under the Skills Panorama (Cedefop, 2016). These skill sets can be applied to all categories of health professionals and associate professionals, and will likely be relevant across different healthcare systems.

3.4. Review of Skills Surveys – implications and discussion

Our review of the available health professional skills assessment surveys found that the most detailed skills surveys are targeted to measure the skills and competencies of pre-qualification students, or post graduate students about to enter the workforce. National training surveys are often mandatory before graduation, and are used to check the competency and qualification of students. These surveys, however, tend to focus on selected skills sets only. Countries in which Continuous Professional Development (CPD) activities are required have well-developed questionnaires on access to CPD, what type of CPD is most effective and respondents' desire for more CPD activities. These modules offer some insights into the skills requirements of mid-career professionals.

It is somewhat surprising that questions regarding skills use, i.e. whether the worker actually made use of the skills and whether they did tasks for which they felt under/over-skilled, were not regularly found in the national surveys of health professional. A few examples of national surveys that asked skills-related questions include the National Physicians Survey of Canada and the General Medical Council's student survey. New Zealand also included surveys that looked into skills use and preferences for up-skilling.

The topics currently surveyed reflect the priority concerns of health professionals and provide important information about a particular aspect of the working conditions or career development opportunities for a certain category of professionals. However, they do not offer a basis for a systematic assessment of the cause of skills mismatch or the appropriateness of the organization and management of the health care workforce, especially in an increasingly globalized, complex and multi-disciplinary care delivery context.

A well-targeted and well-designed skills survey could provide countries with useful information currently lacking in their national surveys. For instance, the topic of skills mismatch is highly specialized and not always properly addressed in surveys, leading to a gap in useful information to inform policy making. As such, a more comprehensive skills survey has the potential to provide countries with a currently unavailable perspective on utilization of their health workforce.

Skills survey instruments developed for the general labour market, such as the PIAAC surveys, offer a more generalized approach to designing a robust and comprehensive skills assessment tool for the health care sector. However, there will be a need to develop additional levels of specificity and details to meet the requirements of the health care sector. Such details could be supplied by the existing skills surveys developed separately for the physicians, nurses and pharmacists, which already offer a very rich source of questionnaires and other assessment tools. The challenge will be to find the right balance between the generalizability of the PIAAC approach with the specificity of the skills assessment tools developed by the various professional groups.

This study proposes to review the instruments already developed under PIAAC and identify where additional work will be required to make them more relevant for the healthcare professionals. In this process, the study will draw upon the rich sources of skills assessment instruments already developed for the different categories of health

workers to identify best examples to adapt and include in a more generalizable and internationally comparable skills assessment approach.

For international comparability, there is an additional challenge of addressing the variability among countries with respect to the roles and functions assigned to different categories of workers. While there is some convergence around the range of functions carried out by a health care team overall, there is significant variability in the assignment of functions to particular categories of workers within the team: for example, in some countries the role of care coordination may be given to nurses, while in other settings this function might be assigned to a physician or a physician assistant. An internationally comparable skills assessment approach will need to establish comparable standards and consistency in terms of the functions and skills required for performing these functions, without being tied to a particular assignment of functions by categories of workers which are unique and specific to each country or health system.

4. Conceptual Framework for Health Sector Skills Assessment

This section proposes a conceptual framework to analyse skills requirements in the health employment sector, including some proposed definitions of key terms. The concepts build on the OECD's Program for International Assessment of Adult Competencies (PIAAC), which undertakes surveys of adult populations for their literacy skills understood as the interest, attitude and ability of individuals to appropriately use socio-cultural tools, including digital technology and communication tools, to access, manage, integrate and evaluate information, construct new knowledge, and communicate with others.

There is a wide range of competencies required of different categories of health care professionals. As discussed below, major groups of health professionals (nursing, medicine, pharmacy) have developed various types of competency frameworks to identify and organize the list of competencies (Englander, et al., 2013).

4.1. Proposal for a Common Competency Framework

The health sector comprises innumerable teams of health professionals, usually including several disciplines. Some teams spend more time on individual patient care, others work with groups of healthy clients, yet others perform managerial or professional governance roles and so on. Teams operate both formally and informally, with some workers participating in multiple teams in a given day. Across teams, workers with different qualifications may have very similar job descriptions. As a result, in today's health care workplace, almost all health professionals share many core skills.

We propose that a common competency framework could be developed that encompasses all the major categories of health professionals and associate professionals. This broad framework would encompass the major functions or "areas of focus" required of every care team and would, at the same time, allow variation based on the type of population that the team is serving. Figure 5, below, shows a competency framework which covers the broad domains of activities (areas of focus) for which a multidisciplinary care team would be responsible. In each of these domains, there will be common sets of general skills, both cognitive and non-cognitive, which will be necessary for the performance of team functions. In other words, a high-performing or well-integrated care team would require workers with competence in each of the domains identified in this example. The framework identifies education and research as cross-cutting competencies that span the other domains.

From the health workers' perspective, each of these domains also offers a career progression opportunity whereby they could develop deeper knowledge and build practice experience in one or more of the domains. Separating the development of competency frameworks from professional categories will allow a more flexible approach to assigning competency requirements to functions that may cut across multiple categories of health professionals. It will also allow new categories of health professionals to be included in the skills assessment framework.

Figure 5 - Domains of competencies for health professionals, by areas of focus
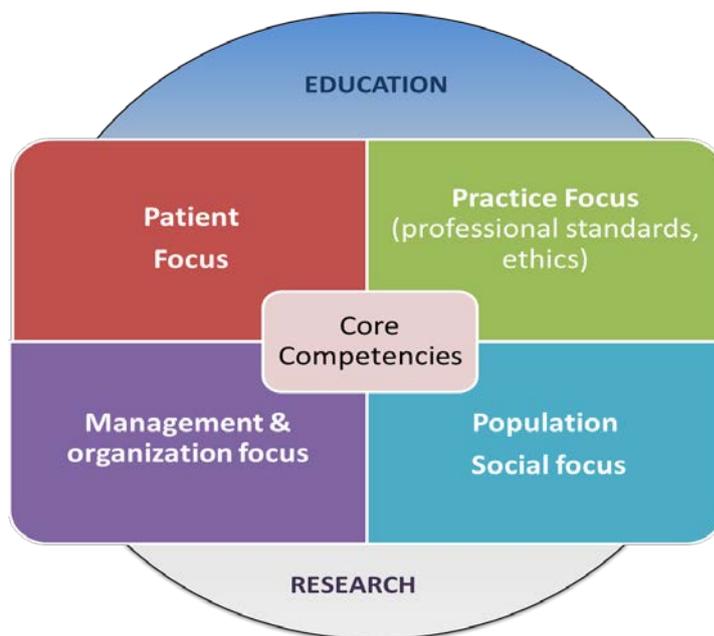
Source: Adapted from Figure 1 in Fédération Internationale Pharmaceutique (2012), "Pharmacy Education Taskforce: A Global Competency Framework", FIP, Geneva.

4.2. Identifying shared skills requirements across healthcare systems

One of the important steps in the process of developing a skills assessment framework is to identify and describe tasks and functions assigned to different categories of health workers for which they must have certifiable skills and knowledge. These functions are usually defined within the "scope of practice" component of regulations governed by state and / or professional associations. Thus, the assignment of particular functions to a group of health workers depends on the regulatory system in place in that location. These differ from one country or province to another; certain tasks will be associated with a specific occupation due to the required qualification to exercise it.

The critical point is to identify common functions - and associated skills requirements – that are essential to all healthcare professionals. It should be possible to develop an approach that can offer internationally comparable skills assessment tools with flexible assignment of skills and functions to different categories of health professionals.

To illustrate this process, we look at the following example from the USA on the determination of service features and functions for complex patients with multiple chronic conditions. Figure 6, below, shows an example of a complex care team with the assignment of specific functions to various team members with different

qualifications and competency profiles. Some functions are shared by different disciplines or delivered by generic workers.

Figure 6 - Assignment of Functions to Different Categories of Health Workers in a Complex Care Team
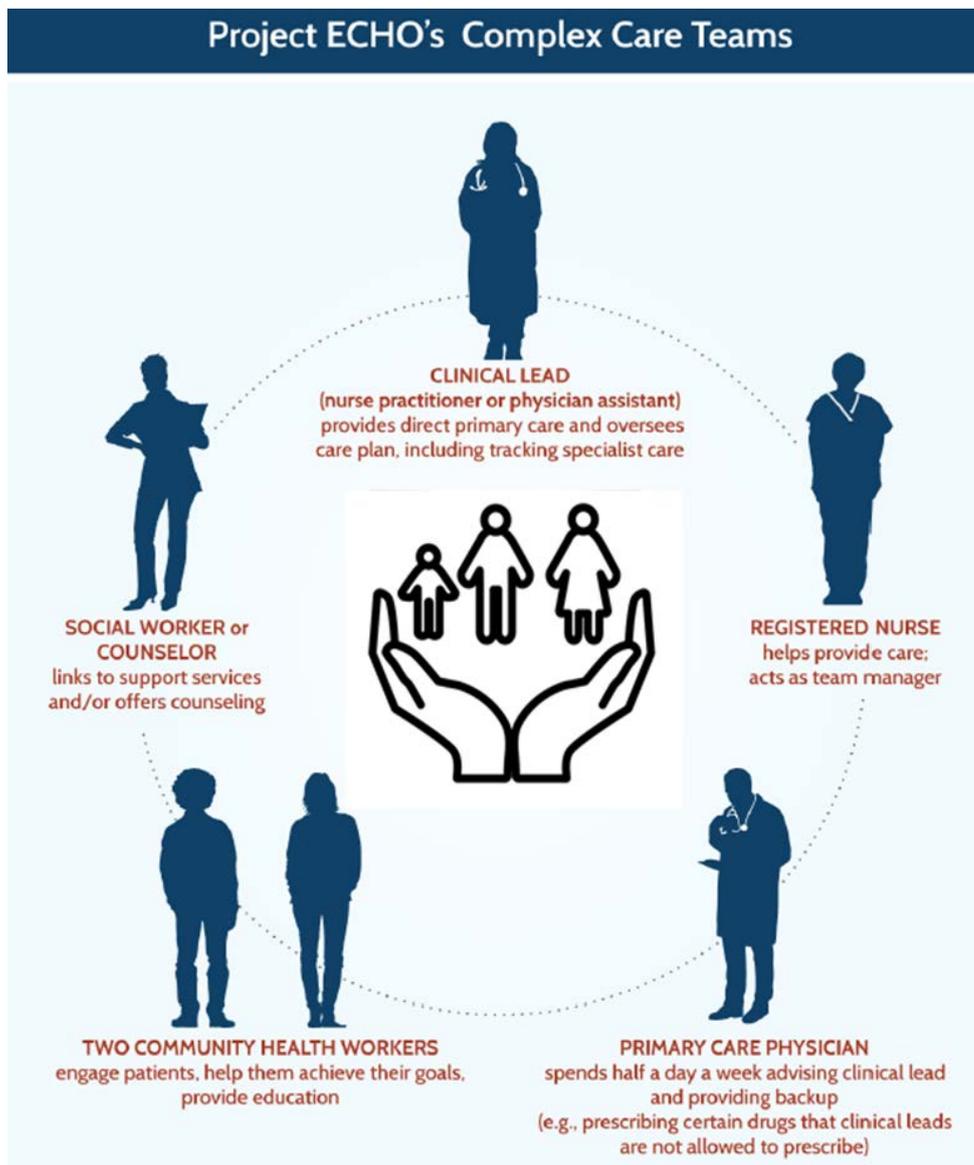
Source: (Hostetter, Klein, & McCarthy, 2016)

Figure 7, below, gives an example of the common features of effective care models identified for this group of chronically ill patients. The care model includes a wide range of functions including social outreach, patient assessments, planning and

coordination, and follow up services. Rather than defining the skills associated with particular categories of health workers, by identifying the common functions and the skills associated with these functions by patient profiles we could make the process independent of the assignment of skills to any specific category of workers. For example, developing person-centred care plans could be a function led by a nurse practitioner, physician assistant, or a general practitioner, depending on the health care system, but the skills required for this function would be similar across the different healthcare systems. Thus, this approach underscores the advantage of addressing the *transversal* skills of all categories of health professionals and associate professionals. This also assumes the relevance of these skills across multiple categories of workers.

Figure 7 - Common Features and Functions of an Effective Care Model for High-Need, High-Cost Patients
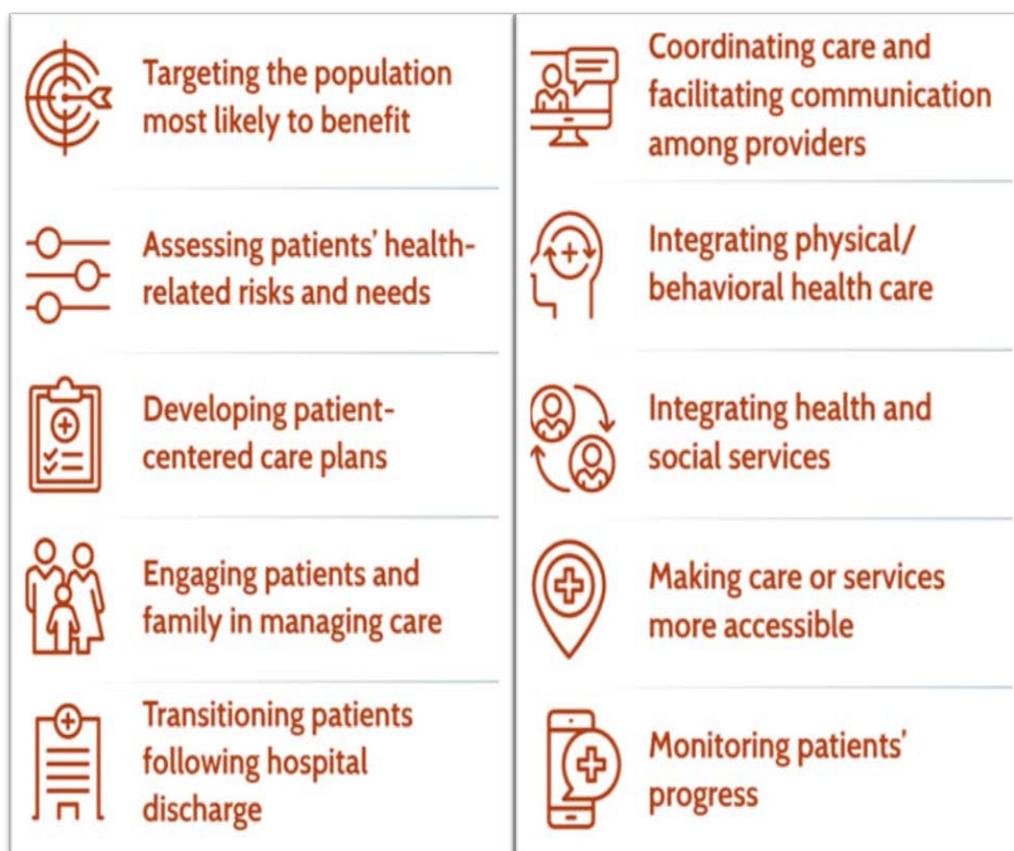
Source: (Hostetter M. , Klein, McCarthy, & Hayes, 2016)

4.3. Understanding the health system and policy context

4.3.1. Introducing a systems perspective

A key issue emerging from the work carried out under the European Commission's Joint Action on Health Workforce Planning has been the increasing importance of *systems thinking* in designing policy assessment tools for health workforce systems, including skills assessment tools. A policy-relevant approach will require that connection be made between health workforce skills and healthcare performance at the system level.

It is not sufficient for workers to possess the skills needed for the new care delivery system: they must also be enabled to use these skills effectively in order to reap benefits in terms of performance: better patient and population outcomes, higher productivity and higher quality of care. A key factor affecting the effective use of skills involves good management practice such as fostering teamwork, balancing work autonomy with accountability, training, flexible working conditions, and other aspects of the work environment. Thus, it is important not only to evaluate the skills in individual workers, but to assess the effectiveness of *work organisation and management practices* across the health care system.

Skills assessment instruments should be designed to offer insights on the potential sources of skills mismatch, and help the policy makers to distinguish between problems of skills mismatch due to inadequate organisation and management of the health workers (e.g., inappropriate assignment of functions to workers or ineffective work flow processes) and the problems arising from inadequate training or education. These analyses could also contribute to identification of other factors that are contributing to skills mismatches, such as the payment systems that do not incentivize teamwork, or regulations that do not allow flexible assignment of tasks to support effective team work.

Figure 8, below, illustrates the system-level policy levers which could have an influence in reducing skills gaps and mismatches to promote the development of effective integrated team. The added value of the skills assessment instrument will be greater when it can start to address and systematically respond to the question of the cause and effect of skills mismatch not only from the perspective of the health workers, but also from the perspectives of the employer, the policy makers and most importantly, from the beneficiaries of the health care system.

Figure 8 - Health system context for skills assessment
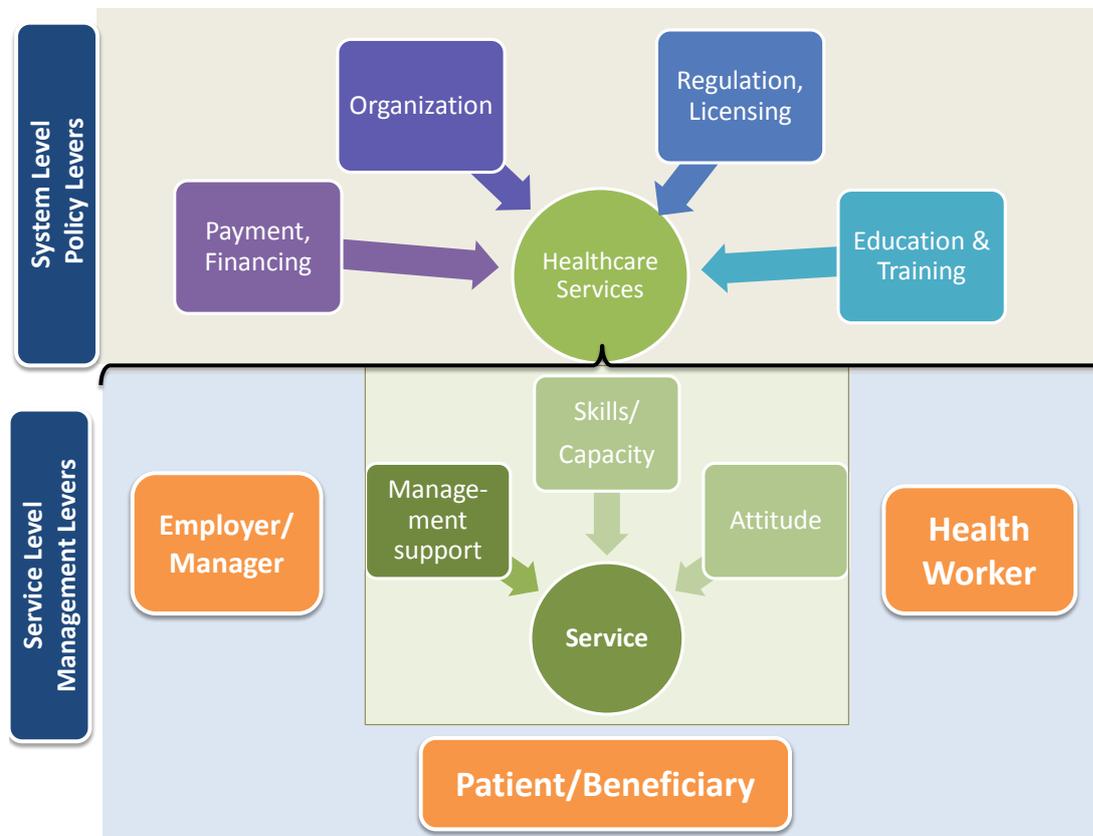
We examined different ways that would help to link the findings of the surveys with the priority health policy objectives. These various approaches are considered in the following sections.

4.3.2. Multi-stakeholder approach to defining priorities

Traditionally, health professionals deliver services within a broader health workforce system, where different functions and roles are associated with different professional groups depending on different countries' rules. But assessing the skills requirements of professional groups separately incurs the risk of missing out on the cumulative or additive effect of skills contributed by all other professionals in a multidisciplinary team context. This point is crucial in view of the growing importance of multidisciplinary teams that include a variety of professionals, such as community pharmacists, physician assistants, medical social workers and physiotherapists.

Since many of the skills assessment tools for the health professionals have been developed and implemented by educational or professional groups and regulatory bodies, the principle focus of these assessments has been the individual workers, considering the working conditions, continuing education needs and career development opportunities for a particular category of health workers.

For the system improvement goals to be achieved, existing skills assessment tools should be enhanced to address the concerns and interests of a wider group of stakeholders, including policy-makers, educators, payers (insurers), employers, and most importantly, the patients. Collectively, these stakeholders will need to come together to find a shared vision and joint solutions to improving the performance of the healthcare system.

Most importantly, there is growing support among OECD countries to consider the individual patient as an integral member of the healthcare team, and to evaluate healthcare performance from the user perspective. Given the importance of this topic, this issue is discussed separately below, in Section 4.3.5.

4.3.3. Linking skills to other health systems performance measures

Another important consideration in the design the survey is to find ways in which the survey results to be more readily cross-referenced with design of other major surveys measuring health system performance. Thus, the value of conducting the skills survey will be enhanced significantly if it could be designed to facilitate correlation between certain health workforce skill sets and improved system outcomes.

For example, there is growing evidence of the impact of improved communication skills and attitudes of health workers have on patient reported outcomes (Costa, et al., 2015). Designing survey questionnaires based on realistic patient scenarios demonstrating the effects of specific skills on patient outcomes will enable evaluation of those skills against important health outcome measures.

This will require a survey design aimed at selection of health workers by institutional setting (hospitals, clinics, community health centres) rather than by individuals selected from the eligible population, as conducted by PIAAC (OECD, 2013). The OECD Teaching and Learning International Survey (TALIS) offers an example of organising the sampling framework of a skills survey in a way that will allow the survey instruments to be linked to relevant institutional structure. Such an approach would link the skills survey findings with other important measures of health system performance, which are often designed around such institutional settings.

4.3.4. Value of international comparability of skills

In addition to adjusting to the significant demographic changes and technological advances, health sector labour market faces an increasing mobility of the workers and globalisation of the education and training institutions. When moving to a new job or to pursue further learning, whether within or across national borders, health workers would like to see their skills and qualifications quickly and easily recognised. The value of the health-sector skills assessment survey would be significantly enhanced if it is able to offer internationally comparable skills assessment and thus contribute to the development of a harmonised approach to the certification process and recognition of skills and qualification.

The EU has developed several instruments to support the transparency and recognition of knowledge, skills, and competences to make it easier to study and work anywhere in Europe (Cedefop, 2016). All EU countries are introducing lifelong learning strategies, based on National Qualifications Frameworks (NQFs) as

a follow up of the recommendation on the establishment of a European Qualifications Framework (EQF). The main purpose of the EQF is to make qualifications more readable and understandable across countries, systems and sectors. The core of the EQF is its eight reference levels defined in terms of learning outcomes, i.e. knowledge, skills and autonomy-responsibility. Covering qualifications at all levels and in all sub-systems of education and training, the EQF provides a comprehensive overview over qualifications in the 39 European countries currently involved in its implementation.

4.3.5. Moving toward integrated and personalised care

In many countries it is becoming evident that the current health system is not organized or staffed adequately to achieve the requirements of person-centred care. Representatives of professional associations often express concerns over the stress caused by the changing nature of care delivery requirements because the current health workforce is not appropriately trained, supported or managed to meet these new demands.

To deliver seamless, well-targeted and personalised care, health workforce teams will need to be organized to be responsive to the varying needs of individual persons in variable states of health and throughout progressive stages of life. The necessary responses include: promoting population health (including psycho-social well-being), treating major episodes of illness and injury, delivering chronic disease care optimally, attending to the special needs of patients at the end of their lives, and offering culturally sensitive care for disadvantaged and marginalized populations.

Patient-Reported Outcomes Measures (PROMs) and Patient-Reported Experiences Measures (PREMs) are part of growing initiatives to include patients in the research processes. PROMs provide reports from patients about their own health, quality of life, or functional status associated with the health care or treatment they have received. The PREMs offer insights into the patients' experience with their care or a health service, is gaining international attention as an effective quality indicator of patient care and safety (Weldring & Smith, 2013). These trends reflect a growing commitment to involving patients and their families in the evaluation of health system performance, and recognition of the importance of the skills of health workers in supporting patients and their family care provider.

Over the last two decades, health care leaders in most OECD countries have promoted a shift from idiosyncratic care by health professionals to more evidence-based approaches, often involving guidance by expert panels and multidisciplinary approaches to individual patients. In some situations, however, this led to over-reliance on standardized protocols. Given the complexity of healthcare services, personalised care cannot be adequately provided through protocol-driven approaches alone. Rather than approach the problem through the compilation of multiple disease-specific solutions, healthcare managers and policy makers are increasingly turning toward defining the service requirements and solutions from patient or person-centred perspectives.

One example is the approach proposed by the US National Academy of Medicines (NAM) to start by clearly setting priorities for service requirements based on the differing care needs presented by different population groups (Lipstein & Kellermann, 2016). The following list includes the four categories of population

recommended by NAM, to which we have added a fifth category to represent the special requirements of disadvantaged and excluded population groups.

1. Persons who are generally healthy and who experience only intermittent and minor episodes of illness or injury, including those who need maternity and perinatal services for healthy new-borns.

2. Persons experiencing acute and major episodes of illness and injury.

3. Persons who have significant chronic medical and behavioural conditions, especially those with multiple, co-occurring conditions.

4. Persons approaching the end of their natural life span who have unique and special health care needs, regardless of their status with respect to a particular diagnosis.

5. Persons belonging to special category of disadvantaged population (e.g., indigenous/minority groups) who, for historic or other socio-cultural reasons, face social exclusion/stigma and isolation, and require special outreach to gain access to care.

Another example is found in a recent report by the NHS Sheffield Clinical Commissioning Group (Hart & Hall, 2017). This list (see Box 3, below) was prepared based on consultations with the clinical practices which chose a range of cohorts of new people they wish to work with to develop new integrated care plans.

Box 3 –Identifying priority population groups for Person-centred Care Programme, NHS Sheffield

NHS Sheffield Patient Care Programme: identification of priority groups of population for developing new care plans
- people with Chronic Obstructive Pulmonary Disease (COPD)
- people with Diabetes
- people with Palliative Care needs
- older people living alone
- people with multiple long-term conditions
- people who are new immigrants to Sheffield who have long term conditions
- people with mental health problems
- people with dementia
- people identified by the Avoiding Unplanned Admissions - Enhanced proactive case finding and patient review for vulnerable people
- people identified by other risk stratification - e.g. frailty index, combined risk prediction tool
- people identified as high users of emergency care services (A&E)

Source: (Hart & Hall, 2017)

In both these examples, it is notable that the priorities have been set primarily from the perspective of the care providers, rather than from the perspective of the general population or patient groups. As noted in Section 4.3.2 above, it will be important to ensure that the patient and general population perspectives are reflected in

identifying the priority groups and care issues. It is evident this will require considerable attention and effort in order to design a skills assessment instrument that will meet the requirements of a person-centred approach.

We find some examples of health care practices that are introducing the concept of patients as an active and co-equal member of the healthcare team. One example can be found in an community-based integrated care initiative in Japan that introduced the role of a "Concierge" to support the multiple care needs of the patient (Taneda, 2016), in which the patient is recognized as a member of the care team. By establishing the role of the patient as a fully participating member of the care team, there was a notable transformation in the attitudes and practices of the health workers on the team.[4] However, these examples appear to be limited in number, and not yet a common practice in many healthcare settings.

The White Paper published in May 2015 by the Norwegian Ministry of Health and Care Services offers an example of a national effort to improve the municipal health and care services based on full dialogue and engagement with and inputs from patients and their families. The guidelines offered in the White Paper are described in Box 4, below.

Box 4 – Norwegian Ministry of Health and Care Services guidelines on involving patients in healthcare

Guidelines on involving patients and family members in healthcare

- The services must focus more on the healthy aspects of the person who is ill and on what she or he is able to do and wants to do.
- Those who provide services must look beyond the diagnosis and view the person as a whole.
- Communication between the health services and the patient must be enhanced, both with regard to language and to understanding the patient's situation and possibilities.
- Service providers must establish a framework for understanding the patient's situation and, together with the person in need of assistance, determine what kinds of treatment are possible and what is needed to help him or her master a life with illness.
- In dialogue with the patient, the services must put more emphasis on involving family and friends.
- Patients must be given the opportunity to choose or reject various forms of measures and assistance. The services must both allow patients to choose the direction and tolerate that they can do so. The services must pay greater mind to the experiences of patients, close family members and others in the network surrounding those who are receiving services.
- The primary health care services must be developed based on inter-disciplinarity as an underlying principle, and more interdisciplinary teams must be established.

Source: (Norwegian Ministry of Health and Care Services, 2015)

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[4] Personal communication with Professor Kenichirou Taneda, interview on 18 July 2017.

In summary, we identify several key elements of the conceptual framework for the skills assessment process. The starting point is recognizing that in today's multi-disciplinary workplace, almost all health professionals share many similar functions. Therefore, we propose a common approach to skills assessment that spans all health disciplines. The assessment tools should be based on common functions and associated skills required of all healthcare professionals. To be policy-relevant, the approach will also require a strong linkage between the skills assessed and healthcare performance at the system level. In other words, we would want to ensure the assessment looks at critical success factors for improving individual patient outcomes, staff productivity and satisfaction, and population health.

The skills assessment approach should consider not only the perspective of the health workers, but also perspectives of employers, policy makers and users of the health care system. From the workers' perspective, skills mismatch and organizational factors are potential sources of workplace stress. Similarly, for employers it will be important to capture structural and organizational factors that affect optimal usage of skills. For policy-makers, the results of the survey should be relevant to the country's priority system concerns and ideally cross-referenced and comparable to other major surveys. Most importantly, from the patients' perspective, the survey should reflect modern thinking about patient-centred and person-centred health care focusing on the skills required to improve the patient experience.

5. Defining the skills

5.1. Transversal skills for personalised healthcare

One of the key questions explored in this study is the identification of skills sets that are highly relevant for front-line health workers and which could be assessed across countries as well as for different categories of health professionals and health associate professionals.

Based on consultations with experts and stakeholders as well as the review of the existing competency frameworks and skills assessment instruments across different categories of health workers, we found a remarkable convergence of the functions and types of skills required to provide person-centred care. These cross-cutting skills include *interpersonal skills*, such as communication, teamwork, and openness to continuous learning, as well as *analytical skills* such as problem-solving skills to devise customised care for individual persons and the ability to use ICT and other forms of technology effectively.

These skills are generally referred to as **transversal skills** (generic and not job-specific). In the broad context of healthcare, *transversal skills* are necessary for the effective application of clinical/technical skills and knowledge. From the perspective of the on-going transformation of health services delivery, transversal skills are the key enablers of the transition away from a disease-centred clinical care delivery approach toward value-based and personalised models of care.

Therefore, transversal skills are recognised as important across different categories of health professionals, who face increasingly complex tasks actively engaging individuals in their own care management and health maintenance while adapting to continuous advances in technology and changes in the rules and standards of healthcare. The convergence of the types of skills that are recognised as important across different categories of health professionals from different countries points to the feasibility of developing a skills assessment instrument that could be applied to all categories of the professionals and across different health systems.

The existing skills frameworks across the different categories of health workers, organise the transversal skills into various sub-categories. Within each subcategory, specific descriptors define required performance or ability to illustrate a particular skill. Yet, these descriptors tend to fall short of covering new dimensions of skill requirements related to the transition towards the person-centred and interprofessional team-based model of health care. Examples of transversal skills, grouped by source, include

- on-going care and decision making for patients with acute or chronic illnesses or complex social conditions across the continuum of care;

- practice-based learning and improvement, situational awareness, communication and teamwork, advocacy and leadership, systems-based practice;

- communication with patients, confidentiality, consent and guardianship, responding to diversity;

- support during loss and bereavement, domestic violence, legal and ethical issues in the care environment;

- professionalism, clinical governance, risk management, quality improvement, teaching and mentoring, professional evaluation; and

- interpersonal skills, managing aggressive behaviour in a team or with patients, conflict resolution, stress and fatigue management.

For that reason, the Study reviewed and consolidated examples taken from different healthcare contexts to describe the transversal skills required for the integrated and personalised models of care – Sections 5.2 to 5.4. We also consolidated the existing skills frameworks with regard to the subcategories of transversal skills and propose to organise the transversal skills into three subcategories listed below and illustrated in Figure 9:

(i) *skills directly related to the delivery of personalised care*:

- skills for person-centred communication with patients and their families or carers,

- skills for shared decision making between patients and providers

- skills for teamwork or interprofessional collaboration and shared leadership,

- socio-cultural competencies;

(ii) *skills for non-routine tasks in complex environment:*

- adaptive problem solving,

- health system awareness,

- ability to use ICT effectively;

(iii) *skills supporting positive work culture:*

- effective stress and fatigue management,

- ability to resolve ethical dilemmas,

- skills for continuous learning and practice quality improvement,

- mentoring and teaching skills.

Figure 9 - Transversal (generic and non-job specific) skills required for successful transition towards integrated and personalised models of care

Source: Authors.

5.2. Skills sets for personalised care

Successful transition towards value-based and personalised models of care will require that care and treatment decisions become a collaborative process between a person who seeks help (or their family/carers) and providers, taking into account the best scientific evidence available, as well as the person's individual and social context, values, goals, and preferences (Kon, Davidson, Morrison, Danis, & White, 2016). This necessitates, for example, understanding what really matters to patients in terms of health outcomes. Therefore, effective person-centred – as opposed to disease-centred - *communication* on the part of health professionals, as well as ability to engage a person who seeks care through *shared decision making,* are crucial. In the context of personalised care, *socio-cultural competencies* also matter as they are essential for effective communication between people belonging to different social, cultural, or age groups. Moreover, shifting the focus from a disease to a whole-

person and ensuring delivery of seamless care requires *interprofessional collaboration and teamwork*, which includes patients as active team members.

5.2.1. Communication skills

In person-centred models of care the set of communication skills evolves from the ability to conduct a provider-centred interview with a patient (focusing on the chief medical complaint) to include the ability to engage patients in their therapy through person-centred communication. The latter expands the attention to a patient's personal and social context as well as values and preferences to inform the choice of the most suitable intervention and to support self-management. For example, an elderly patient with hypertension who takes care of her grandchildren on a daily basis may decide, against the clinician's recommendation, not to take the prescribed hypertension medicine, because it makes her dizzy and lessens her ability to provide care. Effective person-centred communication allows for eliciting information on this patient's personal context and identifying a solution that both preserves her health and recognize her other life goals (Institute for Healthcare Improvement, 2017).

In other cases, delivering effective interventions might require eliciting information on sensitive aspects such as a patient's unmet social needs. Indeed, patients are often reluctant to assert all their concerns as a result of long-standing cultural norms and authority gradient between them and health professionals (see Box 5). Trough person-centred communication, these socially sanctioned roles of patients and clinicians can be re-envisioned and both parties can feel safe in communicating with each other in a context of mutual trust (Berry, Danaher, Beckham, Awdish, & Mate, 2017).

Box 5 – Person-centred communication about patient's personal and social context as elements of effective care

Shortage of skills in person-centred communication may contribute to misdiagnosis and diminished well-being. It can also result in delivery of low-value care, waste of resources, and frustration among health professionals. For instance, for a 67 years old patient, a long list of symptoms such as severe back pain, lack of sleep, and fragile mental state could be traced back to a bathtub. The patient's living conditions were very cramped, after two of her married children moved back in with her due to financial constraints. As a result, the patient had been sleeping in a bathtub. The situation was, however, not revealed during any of a considerable number of return visits to primary care providers. The visits resulted instead in the prescription of antidepressant medication, sleeping pills, and ultimately enrolment in a programme for people with complex medical problems. Only after a community liaison mental health nurse decided to visit the patient's home, the difficult social circumstances behind the health problems were revealed. The patient's condition has improved significantly after a referral to a housing department and arranging for financial grant to buy a single bed.

Source: Authors' personal communications with Frances Hughes, CEO of International Council of Nurses, August 2017.

Person-centred care also moves beyond the focus on reactive care events to promoting and sustaining the health of individuals who are well. In order to engage this part of the population, health professionals need to expand their ability to openly discuss social determinants of health or deliver personalised risk information and motivational interviewing on individual behavioural factors (such as poor diet, smoking, or physical inactivity). People's social environment, family, and culture profoundly influence mind-sets about what can or cannot be done in connection to their health. A person with a family history of heart disease, for instance, might believe that nothing can be done to prevent a heart attack. Similarly, people living in poverty, who often feel they lack control in their life, might believe their health is unavoidably bound to fail (Crum & Zuckerman, 2017). Smokers tend to underestimate their own personal risk of illness compared with that of other smokers (Gilbert, et al., 2017). Through person-centred communication, any perceived barriers or misconceptions can be assessed and a tailored intervention negotiated between a person and a health professional (e.g., dietitian/nutritionist, nurse practitioner, pharmacist, or primary care physician).

As effective person-centred communication serves to build trust in interactions between providers and people who seek care or their families/carers, it supports other tasks such as adaptive problem-solving (see Subsection 5.3.1) and decision making related to the process of care, in particular, shared decision making between patients and providers (see Subsection 5.2.2). Effective information gathering from patients and/or their families supports also resolving ethical dilemmas (see Subsection 5.4.2).

Building trust in interaction between the provider and the patients has other potential benefits to the health system. There is some evidence to show that positive doctor-patient relationships characterised by empathy and good communication can lead to increased patient and doctor satisfaction and decreased litigation and claims against the provider (Mikesell, 2013). This would benefit not only the doctors who will face fewer financial and emotional stress related to the litigation, but it will be of interest to the payer organisations who must also bear the consequences of higher cost of care. From this perspective, it is noteworthy to find that this topic is under active research by a medical insurance agency.[5]

5.2.2. Shared decision making

Person-centred care depends on shared decision making, which has been defined as a collaborative process that allows a person who seeks care (or their family/informal carers) and providers to make health care decision together, taking into account the best scientific evidence available, as well as the person's values, goals, and preferences (Kon, Davidson, Morrison, Danis, & White, 2016) (Tulsky, et al., 2017). In certain clinical contexts, when a straightforward choice can be made, such as a decision about elective surgery, it could be argued that all that is needed is adequate information and consent of a patient. Yet, in most cases, care that a person seeks does not consist of a series of easily defined "take-it-or-leave-it" choices but is a process

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[5] This topic is under investigation by Avant Mutual (Australia) under the Project Title: Understanding risk characteristics associated with medico-legal claims outcomes (Yee, MacDermott, Maitra, Ku, & Moran, 2017).

of understanding between the person and providers developed and deepened through dialogue and interaction (Lehman, 2017).

Shared decision making starts with a patient (or a family/carer) and a health professional (or a team) reaching a common understanding of the reasons help is being sought and the outcomes that are most important to the patient. This is followed by an exchange of knowledge made relevant and understandable to the patient (Lehman, 2017). **Box 6** provides an example of a situation that calls for shared decision-making.

Box 6 – The importance of shared decision making for personalised care

Shared decision making helps to ensure that patients receive care consistent with their goals. For example, a woman in her 80s had experienced a heart attack. In addition, she has chronic kidney disease and type-2 diabetes, but she is still able to care for herself. She qualifies for coronary artery bypass grafting, with an estimated 20% perioperative risk of death (death in relation to the surgery, most frequently defined as death within 24 hours or alternatively within up to 30 days of a surgical procedure). The surgery would also make her dependent on long-term or nursing home care, at least for a while. The patient is a widow and lives alone in a farmhouse where she was born and spent almost all her life. She does not fear death, but leaving the farm and losing her independence are anathema to her. Together, the patient and her physician decide that she would forego the surgery and return home (Cenci, 2016).

Source: (Cenci, 2016)

5.2.3. Socio-cultural competency

Socio-cultural competency is vital to person-centred models of care. Ability to understand and accept the importance of variations in cultural norms to health care delivery supports practicing personalised care despite cultural barriers that might arise when cultures interact (Saha, Beach, & Cooper, 2008). Such situations require that health professionals recognise the cultural perspective of a person as well as their own cultural perception brought to the encounter. Only then, both parties can negotiate an understanding within which a safe, effective and mutually agreeable treatment plan can be implemented (see Box 7).

Box 7 – The challenges of variations in cultural norms to health care delivery

> Patient seen in hospital oncology ward is a 65 year old female admitted two days ago with pancreatic cancer. She emigrated from China with her husband 45 years ago, speaks (English) poorly and prefers to communicate in Chinese. Her two children take turns staying at the bedside and appear overwhelmed by her hospitalization. Although the room is warm, the patient is wearing several layers of clothing. From her grimaces and groans, she is obviously experiencing pain but when asked by the hospital staff, states she is "OK." Her son asks, however, the (attending doctor, nurse) why his mother is not receiving analgesia because she is clearly uncomfortable. There are several bottles on the patient's bedside table, which the son explains are traditional Chinese medicine, which the patient wishes to use alongside the Western treatment.

Source: Authors' personal communications with Alex Berland, School of Population and Public Health, The University of British Columbia, Canada.

Socio-cultural competencies are also important for applying collaborative and interprofessional models of care. Various categories of health workers have developed their unique professional and work cultures that include attitudes towards and beliefs about roles of other health personnel. Some differences may even exist between different generations within the same professional category. Effectiveness of the collaborative and interprofessional care depends on whether professionals belonging to the different categories and/or age groups are aware of these differences and can take an objective assessment of their own perspective brought into the interactions with others, adapting it if necessary to recognise the role of other professionals on the team.[6]

5.2.4. Team work, interprofessional collaboration & shared leadership

In person-centred models of care, team work evolves from a "multi-disciplinary" situation where health professionals from different disciplines independently formulate care decisions and subsequently discuss them, to an "interdisciplinary" approach, where the team jointly reaches consensus about treatment/care goals and choices and the patient is involved as part of the team. To practice interdisciplinarity, individual team members need to share a common understanding of the team's goal, comprehend and accept roles of the other team members, and be able to adapt their professional identity to complement and support the team's work. This leads to an "interprofessional" approach, where the team jointly reaches consensus about treatment/care goals and choices and the patient is involved as part of the team. Interprofessional practice requires individual team members to share a common understanding of the team's goal, comprehend and accept roles of the other team members, and be able to adapt their professional identity to complement and support the work of others on the team.

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[6] Authors' personal communication with Paul de Raeve, Secretary General, European Federation of Nurses Associations

Team work, both within formal and less formal teams (see examples discussed below), relies also on skills in shared leadership, which can be described as working both with and through others. It implies that each team member must recognise his or her specific role and field of expertise as well as those functions and areas of practice where others are the experts and should take the leadership role. For instance, in a team with a designated formal leader, his or her function is not to command and control but to coach and empower all the team members; conversely, the role of the team member is to feel entitled as well as obligated to act autonomously within the plan of care, report problems, and provide feedback on areas requiring improvement.

Many health organisations are increasingly introducing community health workers (CHWs) into healthcare teams with the aim of cultivating strong relationship with patients, especially those with chronic conditions. CHWs fulfil crucial function of understanding the patient's personal situation and what is required to help him or her master a life with illness. On the basis of that knowledge, healthcare teams, together with the person in need of assistance, can better determine what services are necessary. For successful implementation, the CHWs and other team members must share uniform understanding of the team's goal (optimising health outcomes that matter to patients vs. solving all of the patient's personal problems or focusing exclusively on progression or regression of a disease). Moreover, the role of CHWs must be equally recognised by all team members, including CHWs themselves as well as patients, and the CHWs must be entitled to take leadership on issues within their scope of expertise.

A team can also be defined as a group with any recurring interactions between at least two professionals for the purpose of providing health care. For example, pharmacists seek to identify, resolve and prevent real and potential drug-related problems. Therefore, pharmacists need to effectively work together with the prescribing clinicians to ensure that optimal care is achieved. The case of a patient with polypharmacy illustrates the issue (see Box 8).

Box 8 – Interprofessional collaboration between pharmacists and prescribing clinicians

Patient seen in community pharmacy is an 82 year-old female currently being appropriately treated by her family physician for congestive heart failure, glaucoma, hypertension, and osteoarthritis. She has just had an appointment with a new orthopaedic physician where she complained of persistent arthritic pain in her knee. The physician prescribed an NSAID for pain and inflammation. From the orthopaedic standpoint, prescription of NSAID is good practice. However, from a cardiac standpoint, this is a risky approach due to the potential side effects of NSAIDs, which can be dangerous for an individual of this age. Pharmacists possess knowledge needed to issue a recommendation to the prescribing physician such that the patient's outcome is optimised. Yet, whether and how well the pharmacists and the prescribing clinician manage to resolve the problem depends on their attitudes towards, and skills in, collaborative interprofessional patient care.

Source: Authors' personal communications with Alex Berland, School of Population and Public Health, The University of British Columbia, Canada.

5.3. Skills for non-routine tasks in complex environment

Health professionals increasingly deal with non-routine tasks in an increasingly complex environment, by engaging individuals in their own care management and health maintenance while adapting to continuous advances in technology and changes in the rules and standards of healthcare. Consequently, skills in *adaptive problem-solving* as well as general *health system awareness* are crucial. Furthermore, in this complex environment *skills for effective use of ICT tools* are increasingly required to facilitate communication with patients, other caregivers, as well as facilitating and documenting teamwork and other forms of distance interprofessional collaboration.

5.3.1. Adaptive problem-solving

The transition to person-centred and interprofessional models of care puts an emphasis on the importance of skills in adaptive problem solving. For example, the development of a personalised treatment and care plan requires the ability to flexibly adapt available options and arrangements to each person's context, values, and preferences. It means that the development of a treatment and care plan becomes much more case or context dependent and might include problems for which no guideline-based solutions exist.

Taking the example of a prevalent problem such as poor adherence to medicines helps to illustrate the importance of skills in adaptive problem solving. Up to 75% of patients do not take their medicines as recommended by the prescribing clinician depending on the population studied, the medication, and the adherence measures used (OECD, Forthcoming). While statistics suggest simplified dosing or motivational discussions often help to address the problem, personalised solutions are still needed – Box 9.

Box 9 – Importance of skills in adaptive problem solving for personalised care

> Three chronic patients do not take their medication as recommended by the prescribing clinician and as a result, they are not controlling their illness. The reasons behind the problem are different for each of the patients, however. One patient frequently misses doses of her medicine, because it is hard to include taking her osteoporosis medication as part of her daily routine, due to multiple work duties. A simplified once-a-month dosage regimen is available and, if prescribed, could solve the problem. The second patient is a retiree – also suffering from osteoporosis - and has been prescribed the once-a-month dosage regimen, which he, nevertheless, completely forgets due to its infrequency. Indeed, the patient would prefer daily regimen because that would help him establish a routine. The third patient suffers from hypertension but does not follow the prescribed drug therapy, because he is overwhelmed taking care of his seriously ill wife, with no assistance from anyone else. In the latter case, a seemingly unrelated problem needs to be addressed to improve the patient's adherence to medicine, e.g. in a support group for informal carers, by counselling, or by deploying community resources.

Source: Authors.

Moreover, the development of a personalised treatment and care plan within a team of professionals will involve adaptive problem-solving skills in finding an effective approach to coordinating care among many actors, including patients and their informal care providers. Skills related to adaptive problem solving are crucial also for solo practitioners, especially those practicing in remote and underserved communities. In these areas skills-mix gaps might exist due to shortages of health personnel. Hence, professionals located there need to be resourceful, knowing when and where to look for help and additional resources, and have an ability to be a "generalist" (Palsdottir, et al., 2016).

5.3.2. Health system awareness

For successful transition to person-centred and interprofessional team-based models of care, health professionals need broad health system awareness beyond the boundaries set by the typical face-to-face patient care encounter. This wider practice and health system perspective is necessary in order to adequately assist patients in their journey through a health system such that each of them knows what to expect and receives seamless care (the right treatment, at the right time from the right provider). In other words, health professionals need to understand the functions of the varied parts of the system in order to be comfortable in helping to "navigate" their patients through it.

This implies skills in dealing with administrative and legal aspects of health care processes as well as understanding administrative and legal responsibilities of different organisations or members of a care team. For example, when patients need to be transferred between different types of providers, health professionals need to be aware of aspects such as waiting times for services at the other providers or available transport options and how these options can be adapted to meet the patients' needs as dictated by their condition.

5.3.3. ICT skills

In general, health professionals need ICT skills in daily practice to benefit from technological advances, such as electronic patient records or quality indicator databases. In the context of the person-centred and interprofessional team-based models of care, ICT skills are crucial as technological advances – for example, patient-reported outcomes in mobile applications – allow patients to become more engaged in and self-manage their own care. ICT proficiency also facilitates communication with other caregivers, team work, and all forms of distance interprofessional collaboration.

The relevant abilities encompass not only technical proficiency with the equipment and software but also ease in sharing information, understanding of privacy and confidentiality policies, managing or influencing others through electronic means of communication. Moreover, ICT skills underpin mind-sets to use the available data and analytic tools to help share experiences and learn from successes and failures for the purpose of continuous knowledge development as well as quality improvements (see Subsection 5.4.3).

5.4. Skills supporting positive work culture

The ongoing system changes are placing enormous strains on the health workforce. This is evident, for example, in the increasing rate of "burnout" among different categories of health professionals (Dyrbye, et al., 2017) that could negatively affect their ability to provide safe and effective care for the patients. Also, moving away from managing discrete diseases towards what matters most to each patient can give rise to new kinds of professional and ethical dilemmas. Hence, skills in *effective stress and fatigue management* as well as skills related to maintaining *professional standards and ethics*, such as identifying and resolving moral dilemmas, are vital for sustaining positive work culture. Similarly, mind-sets for *continuous learning and practice quality improvement* are essential for facing challenges posed by the ongoing evolution of population health needs and the corresponding changes in health care delivery system. Moreover, *teaching and mentoring* skills are important for shaping positive work culture since they influence how well young health professionals are prepared for their practice.

5.4.1. Stress and fatigue management

Health professionals in general are at relatively high risk of burnout and stress-related health problems (Eurofound, 2012). While engaging patients (or their families/carers) and practicing collaboratively might improve patients' outcomes, thus enhancing the meaning of work and increasing work satisfaction of health professionals, it also can lead to stressful work situations. In particular, some patients might have difficulties in shared decision making, and health professionals could become exposed to personal conflicts between patients and their families or among health care team members.

Without adequate skills in stress and fatigue management, such situations might result in burnout and related health problems. The relevant skills include the ability to accept that such situations can arise, controlling one's emotions and communication in order to manage the situation, and recognising if one's own health becomes affected. Crucial is also ability to communicate effectively about stress and fatigue and analyse the problem with peers and/or supervisors. The latter means that all the team members (both on formal and informal teams of collaborating professionals) need also skills in recognising when their colleagues are challenged and intervening. Indeed, team work offers unique support mechanisms for stress and fatigue management, providing that the team members are adequately skilled.

5.4.2. Professional standards & ethics

Ethical issues are omnipresent in health care. Thus, skills in identifying moral issues (e.g. naming the conflicting ethical principles) and resolving them (determining and explaining which principle should be given priority and why) are central to being a health professional. Moving away from managing discrete diseases towards what matters most to each patient can give rise to new kinds of professional and ethical dilemmas. Health professionals should be aware of these new dilemmas and find solutions. Take as an example a patient with advanced breast cancer who is not responding well to chemotherapy and who wants to try high-dose intravenous vitamin C instead. Her physician says she had reviewed the evidence and found that the alternative treatment does not appear to be effective and has potentially serious side-effects, albeit rarely. The patient understands the risks and says she would like

to try it – nothing else seems to be working anyway. In this example, would person-centred care mean agreeing to whatever the patient wants?

In other complex ethical situations, two mutually exclusive options can follow from a single ethical principle, e.g. the principle of beneficence directing the physician to perform a certain procedure to minimise a patient's discomfort from an obstruction and yet also beneficence to abstain from performing the procedure so as to avoid the patient enduring numerous possible complications (Favia, et al., 2013). A scenario illustrating this dilemma is shown in Box 10, below.

Box 10 - Complex ethical situations - end of life in hospital setting

A patient seen in a hospital Emergency Department (ED) is a 60 year-old male with chronic bronchitis, hospitalised three times in the past year and who on the last occasion was ventilated. Since then, he has been unable to walk outside his home, due to his shortness of breath. The patient accepted that situation but could not imagine living with a further deterioration of his state of health. His main fear has been that if he is ventilated again, he would never get off the ventilator. Now, he is presenting at the ED with severe respiratory difficulty that could warrant ventilation. What would the principle of minimising harm dictate in this situation?

Source: Authors' personal communications with Alex Berland, School of Population and Public Health, The University of British Columbia, Canada.

5.4.3. Continuous learning and practice quality improvement skills

Successful implementation and delivery of the person-centred model of care require readiness to evolve with continuous changes in the populations' health needs and expectations, as well as with health technology. This creates a need for health workers to accept that learning and professional development must be an ongoing element of their entire career and recognise their own learning needs. Moreover, learning should be embedded in regular work activity, not confined to periodic training courses. Health professionals should also be able to seize the opportunities to learn through interprofessional collaboration, in particular from the experience of other professionals. Learning is also supported by capabilities such as technical skills in seeking information - ICT skills - discussed above in Section 5.3.3.

Alongside the commitment to continuous learning, skills in translating knowledge into continuous practice quality improvement are equally needed. The latter include capability to apply quality improvement science to make a significant contribution to immediate working environment and system improvement beyond face-to-face patient care (Hockey & Marshall, 2009). For the health care delivery system to become person-centric, health professionals will increasingly need abilities to determine and prioritise potential areas of improvement, e.g. to identify groups of high-risk patients, barriers to care such as long patient wait times or management issues such as low morale and poor communication. Furthermore, ease in data collection and analysis, with the use of the available ICT tools, is central for quality improvement as it facilitates understanding how well the practice/system works, setting measurable goals, and monitoring the effectiveness of change.

Successful quality improvement relies on routine collaboration among leaders/managers and front-line workers, hence it depends also on the level of skills in team work and shared leadership (see Subsection 5.2.4). The leaders/managers cannot bring about a change by themselves, but need to be able to inspire, engage, and empower all front-line workers to enact improvements.

5.4.4. Mentoring and teaching

Many health professionals perform dual roles as carers plus mentors or teachers. Thus, their ability to practice the person-centred and interprofessional models of care needs to be accompanied by an ability to effectively transfer their knowledge and skills to others. Recalling the above-described scenarios of various patient encounters and problems, a health professional who successfully manages to resolve them, should also be able to provide guidance/training to others on how to achieve such outcomes. For example, teachers and mentors need to be able to equip others with categories and tools in interpreting patients' narratives for improved diagnosis and treatment planning, just as they do in teaching how to intrepret ultrasound or other clinical tests (Cenci, 2016). In order to be the right teacher, mentoring and teaching skills need to be accompanied by skills in continuous learning (see Subsection 5.4.3).

6. How to measure skills – proposed methodology

This section discusses the instruments, which could be adapted for the purpose of assessing transversal skills of health workers and how are they used at work. The section also describes different approaches to survey sampling and administration that could be used in the design of the survey. The section concludes by discussing the merits and costs of the different instruments and sampling approaches.

6.1. Instruments for assessment of transversal skills and their use at work

A number of assessment instruments exists that can serve as a background for development of the international skills and skills use assessment tool. The complexity of work performed by health workers makes assessment of transversal skills a particularly challenging task. Nonetheless, the importance of these skills for the effective application of the clinical/technical skills and knowledge has fuelled the development of various assessment instruments - either self-reporting survey tools or direct assessment tools. These instruments are being continuously developed and updated to reflect the methodological advancements as well as the on-going change in health care practice. There is a clear recognition, however, that the skills will in part remain intangible, as both, the self-reporting and direct assessment tools measure skills in a simulated environment.

The assessment of transversal skills can be conducted combining self-reporting survey tools and direct assessment tools. Each of the two types of the instruments has certain advantages and disadvantages, depending on a skills set or aspect. The self-reporting survey tools carry an inherent risk of social-desirability response bias by respondents but are relatively easy to apply and involve lower costs of administration. Also, by providing the respondents with an explicit description of skills and context, to which the skills apply, they offer rich learning material. In general, self-reporting tools are suitable for assessment of most of the skills set described in Section 5 and are the only tool available for the assessment of skills use. Direct assessment tools include observational methods and tests using multiple-choice or open-ended response questions related to a scenario-based task. The direct assessment tools have the potential to deliver a more objective assessment of skills, but are relatively more complex in design as well as expensive to administer and update. They are, however, the only tools that allow for capturing skills involving higher-order cognitive constructs such as adaptive problem solving.

The existing skills assessment instruments have been developed by and for the different categories of health professionals or associate health professionals. Despite this fragmentation, the instruments aim to assess the same categories of transversal skills. This confirms the universal importance of these skills among the front-line health workforce as well as the potential to design a unique instrument for assessment of transversal skills across different categories of professionals.

Beyond serving the assessment of skills, the results produced by these instruments stimulate the general discussion and advancements of knowledge on how to better assist professionals in developing transversal skills, both through initial education as

well as continuous development programmes (CDP). The instruments provide also useful immediate feedback to the participating professionals on their skills level and can stimulate learning through self-reflection (Jepsen, Ostergaard, & Dieckmann, 2015).

6.1.1. Common conceptual framework behind the skills assessment instruments

The skills assessment tools, both the self-reporting survey tools and the direct assessment tools, share a common conceptual framework. Skills are taken to be reflected by specific "good practice" behaviours. For each skills set, characteristic behaviours can be defined. In the context of skills related to, for instance, team work, one of these specific behaviours can be described as *Intervening effectively to improve team activities*. Each example of "good practice" behaviour can be paired with a corresponding example of poor behaviour: *Concentrating on one's own tasks ignoring team's overall aim.* The "good practice" behaviours reflecting a given skills set are often referred to as behavioural markers and can be grouped under elements of a skills set. The important elements of the team-work skills set include: (i) partnership, (ii) mutual support, and (iii) coordination. The above example of "good practice" behaviour belongs to the "mutual support" element (Fletcher, et al., 2004).

Informed by social cognitive theories, the skills assessment tools recognise that a certain good or poor behaviour depends not only on an individual's skills (self-perceived efficacy) but also on attitudes towards the behaviour (Jepsen, Ostergaard, & Dieckmann, 2015). For instance, whether an individual intervenes effectively to improve team activities depends on a specific skill such as *effective sharing and exchanging of ideas with a team* as well as on a positive attitude towards the team work: *"The team approach improves quality of care for patients",* as opposed to a negative attitude: *"Working in teams unnecessarily complicates things".* Figure 10 summarises the conceptual framework behind the various skills assessment tools described in this section.

Based on the conceptual framework, the skills assessment tools rely on questions about attitudes and the level of skills that are either answered by respondents, in case of the self-reporting surveys, or the observers, in case of the direct assessment tools relying on observation of actual behaviour. For instance, in a self-reporting questionnaire about teamwork skills, the respondents are asked how high they rate their skills in carrying out a specific task. Table 3, below, provides an example. In the direct assessment tools of observational type, the same questions can be directed at a trained observer, who rates the abilities of an individual within a team to perform the specific tasks based on the observed behaviour and its outcomes.

Table 3 – Self-reporting questionnaire on teamwork

Please indicate how you rate your skills in carrying out the following tasks:

	Poor	*Fair*	*Good*	*Very Good*	*Excellent*
Effectively share and exchange ideas within a team	O	O	O	O	O
Develop an interdisciplinary care plan	O	O	O	O	O
Adjust your care to support the team goals	O	O	O	O	O

Source: SunCountry Health Region, *Assessing team attitudes & functions – A set of pre & post questionnaires*, downloaded April 2017, https://nexusipe.org/informing/resource-center/athct-attitudes-toward-health-care-teams-scale

Figure 10 - Conceptual framework behind the skills assessment tools: example for developing teamwork assessment
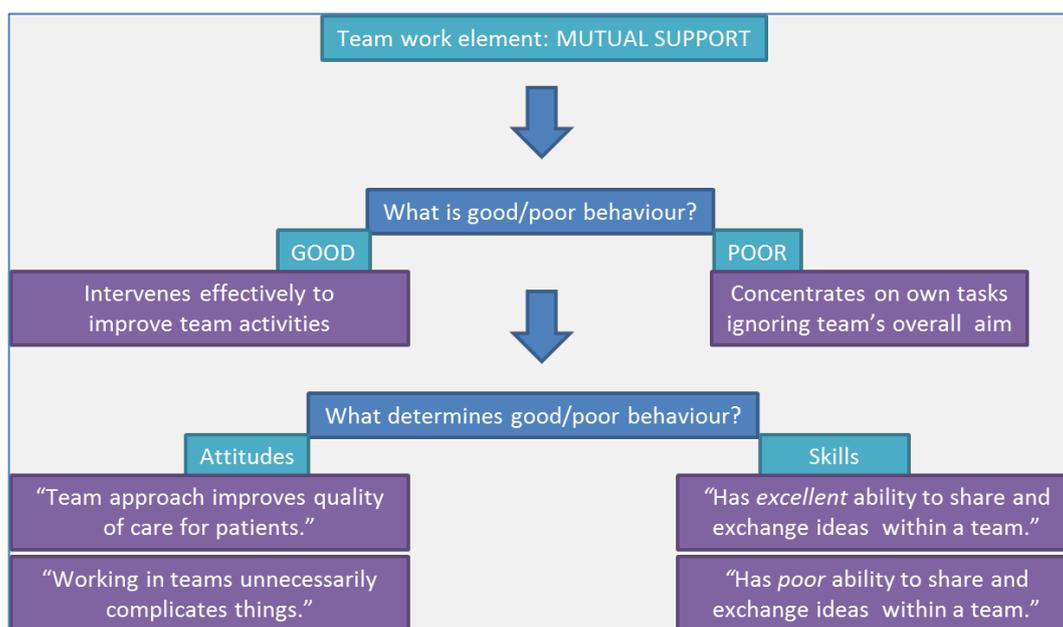
Source: Authors' own compilation.

In the direct assessment tools based on examinations/tests, the framework informs the design of multiple-choice or open-ended questions, answers to which can be used to infer the respondents' attitudes and proficiency in performing specific scenario-based tasks. The conceptual framework underpins also the scoring rules used by the raters of the test, in a way corresponding to the scoring by observers in the direct assessment relying on the observation of actual behaviour.

Most of the skills assessment instruments recognise also that settings in which skills are used influence the performance of professionals by, for instance, affecting what skills and how frequently are used in the daily front-line practice. Therefore, these instruments are accompanied by an additional self-reporting module – frequently included in a background questionnaire - that consists of questions about skills use. These questions focus on the frequency with which tasks requiring certain skills are performed and/or perceived organisational barriers to performance of these tasks, such as financial (dis)incentives, lack of managerial support for certain behaviours, or unsupportive organisational culture.

6.1.2. Qualitative research behind development and updating of the assessment tools

The development of the above-discussed types of tools is typically preceded by dedicated expert/focus groups discussions and in-depth analysis of needs of specific patient groups and/or practice arrangements to inform what skills should be measured and with what behavioural markers (examples of the best practice behaviour and poor behaviour). The behavioural markers are usually chosen on the basis of analysis whether their presence (best practice behaviour) is associated with good health outcomes and their absence (poor behaviour) with worse patient outcomes or endangers patient safety. The selection of behavioural markers is also often informed by clinical guidelines, where they exist.

The existing instruments are also continuously updated as patient needs, practice arrangements, or professional roles change. Besides changes over time, the behavioural markers are also subject to changes based on the frame of reference from which they are seen (Jepsen, Ostergaard, & Dieckmann, 2015). In particular, the self-reporting instruments are being continuously adapted to reflect the transition away from the disease-focused and towards the person-centred models of care. This transition brings in the perspectives of patients on what they perceive to be good health outcomes. Therefore, the examples of the best practice behaviour evolve from those that can be associated with an absence of illness to reflect health outcomes that matter to patients, such as the degree to which the quality of life is restored. Indeed, while the direct assessment tools are usually developed by professionals, the development of the self-reporting tools frequently involves consultations with patient groups as well as different categories of professionals.

6.2. Self-reporting tools for skills and skills use assessment

The foundations of the existing self-reporting skills assessment instruments have been originally developed in connection with the workplace training offered to employees of healthcare organisations that pioneered the transition away from the disease-specific models of health care towards person-centred and interprofessional team-based models. In these transition efforts, the organisations frequently faced challenges in recruiting professionals with strong transversal skills (The Commonwealth Fund, 2016). In consequence, the workplace training sessions have been developed along with suitable pre- and post-training skills assessment tools to assist monitoring of progress and provide feedback to the participating professionals. Usually, the development of these instruments has been a joint effort between the healthcare organisations and the research community.

Other instruments have been created by educational institutions in an attempt to fill the gaps in the assessment of various transversal skills, which often has been given a secondary priority in the educational curricula as compared with the assessment of clinical/technical skills (Jepsen, Ostergaard, & Dieckmann, 2015). In particular, introduction of new courses or elements of training, such as Interprofessional Education/Practice, resulted in development of new self-reporting assessment tools.

As a result, a considerable number of self-reporting skills assessment tools for various groups of health professionals and associate health professionals exist that provide a rich repository of material and methods for the development of an international assessment tool. Specifically, various tools have been designed for assessing skills sets related to teamwork/shared leadership and interprofessional collaboration, shared decision making, person-centred communication, socio-cultural competencies, occupational health and safety, and continuous learning (for examples please see the Appendix).

Most of the instruments developed by and for the different categories of health professionals or associate health professionals consist of almost the same categories of transversal skills. This confirms the universal importance of these skills among the front-line health workforce as well as the potential to design a unique instrument for assessment of transversal skills across different categories of professionals. Indeed, there are instruments, which were originally developed to assess, for example, the level of cultural competency among physicians and subsequently used to assess the same skill sets among pharmacists, requiring only moderate modifications (Okoro, Odedina, Reams, & Smith, 2012).

These instruments are continually developed and many of them have earned international recognition, being used in a number of countries as assessment tools for skills training interventions. Moreover, the feasibility of developing an international self-reporting assessment tool is further illustrated by the experience of the OECD Teaching and Learning International Survey (TALIS), which is the largest international survey of teachers' professional development, classroom and school working climate, satisfaction with their jobs, and their feelings about their professional abilities (OECD, 2014). While TALIS is not explicitly dedicated to measuring teachers' skills, the survey illustrates universality of certain aspects that affect performance of a given sector – such as education or health care – which can be successfully measured across different countries with different legal, organisational, and financial structures.

Self-reporting instruments assessing health system awareness and skill sets for ICT are relatively less well-developed. There exist examples of overview surveys aiming to establish the state of knowledge about general health system arrangements or existing ICT tools (including eHealth and mHealth) and demand for related training among various professionals. These overview surveys are usually carried out by national professional associations. Moreover, the European Commission's EU Digital Agenda for Change has developed a survey "Benchmarking Deployment of eHealth among General Practitioners (GPs)", which details the technical skills that the GPs possess with regard to IT systems for health (European Commission, 2013). These surveys offer useful background material for development of the international ICT skills assessment tool.

With regard to skills set for adaptive problem solving, no self-reporting tools have been identified. The existing instruments rely on direct assessment methods and are either under development or not specific to health workforce (see Section 5.3.1).

6.2.1. Addressing self-reporting bias

The self-reporting tools carry an inherent risk of social-desirability response bias by respondents. A number of studies suggest, however, that the results of self-reported surveys can be made more robust when they are combined with other aspects of skills, such as attitudes toward the skills use (Cowan, Barnett, Norman, & Murrells, 2008). Therefore, respondents are usually asked first to report on their attitudes towards certain behaviours or tasks by indicting their level of agreement with proposed statements (using Likert scale), for example one of the surveys measuring attitudes towards patient involvement includes the statements (Agency for Healthcare Research and Quality, 2017) shown in Table 4, below.

Table 4 – Questionnaire on attitudes toward patient involvement

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important to ask patients and their families for feedback regarding patient care.	O	O	O	O	O
Patients are a critical component of the care team.	O	O	O	O	O
Adverse events may be reduced by maintaining an information exchange with patients and their families.	O	O	O	O	O

Source: Agency for Healthcare Research and Quality, Rockville, MD, Teamwork Attitudes Questionnaire (T-TAQ), Content last reviewed April 2017.
http://www.ahrq.gov/teamstepps/instructor/reference/teamattitude.html

After answering the questions regarding the attitudes, respondents are asked to report on their self-perceived level of skills (self-perceived efficacy) in performing given tasks, using a scale with a detailed description of each skills level. Table 5, below, is extracted from the Self-Assessment of Shared Decision Making Knowledge and Skills Survey (The Health Foundation, 2013).

Table 5 – Questionnaire on shared decision making

	Skill level				
	1 *(Unaware)*	*2* *(Aware)*	*3* *(Informed)*	*4* *(Capable)*	*5* *(Recognised)*
I am able to introduce a preference sensitive decision in a consultation.	O	O	O	O	O
I am able to explain why there is more than one treatment option.	O	O	O	O	O
I am able to portray the options and check for understanding.	O	O	O	O	O
I am able to elicit the patient's personal preferences.	O	O	O	O	O

Source: The Health Foundation, MAGIC – Making good decisions in collaboration: Self-assessment of Shared Decision Making knowledge and skills, 2013.

For skills related to team work/shared leadership and interprofessional collaboration, self-reporting tools allow also for assessing the sum of skills within a team by asking the respondents to rate the team's overall performance on selected items. Table 6, below, is extracted from the Team Fitness Test, which asks respondents to rate a number of statements as it applies to their team (Sun Country Health Region, 2017).

Table 6 – Questionnaire on team fitness

	Definitely	*Most of the time*	*Occasion-ally*	*Not at all*
Our roles are clearly defined and accepted as defined by all team members.	O	O	O	O
Team members feel free to give their honest opinions.	O	O	O	O
We are skilled in reaching consensus.	O	O	O	O
In team meetings we stay on track and on time.	O	O	O	O

Source: Sun Country Health Region, Geriatric Interdisciplinary Team Training Program: John A. Hartford Fdn, 2017: http://www.gittprogram.org/index.html

6.2.2. Adding scenario-based approach

There is evidence that transversal skills of health professionals are to a certain degree case and context specific and this needs to be taken into account when designing instruments for assessing the skills. Behaviour adoption can be modulated by several aspects of the context, such as characteristics of a patient or the health problem

(Godin, Belanger-Gravel, Eccles, & Grimshaw, 2008). Taking an example of person-centred communication skills, assessment of whether a health professional uses understandable and non-technical language may apply differently with a technical case, such as pre-operative counselling of a patient for appendicitis, compared to one that is not as technical but much more emotionally charged, such as breaking bad news about terminal illness (Baig, Violato, & Crutcher, 2009).

Therefore, in order to further limit the risk of bias in self-reporting skills assessment tools, the questions/statements, to which the respondents are expected to react should be made case-specific i.e. rely on a detailed scenario describing the context and the person/patient that the professional is interacting with. For instance, in one of the existing surveys of pharmacists' skills related to delivering person-centred care, the respondents were asked the following question with regard to their perceived levels of skills (Farris & Schopflocher, 1999). This is illustrated in Table 7, below.

Table 7 - How confident are you that you can successfully perform the following tasks?

	Extremely not confident	*Not confident*	*Cannot say*	*Confident*	*Extremely confident*
Identify the patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the patient's desired goal(s)	O	O	O	O	O
Identify the patient-specific drug-related problem	O	O	O	O	O
Obtain the patient's social history	O	O	O	O	O

Source: (Farris & Schopflocher, 1999)

These questions about self-perceived level of skills (self-efficacy) in performing the listed tasks could be made case and context specific when accompanied by the scenario described in Box 11.

Box 11 – Example of a patient scenario

> John presents at your dispensary counter for a refill of his blood pressure medication and you notice that he is 21 days late. When you ask why, John explains that he only takes the medication when he needs to. He measures his blood pressure once a day, then takes his medication according to the results! In this case, it appears that John expects his blood pressure medication to work like aspirin for a headache. He doesn't understand that the medication is not used on an "as needed basis". In short, John's expectations of therapy are inappropriate and have resulted in noncompliance.

Source: Janke, K.K and Tobin, C., Initiating Practice Change: Negotiating Goals of Therapy with Patients, Dalhousie's Pharmaceutical Care Project, College of Pharmacy, Dalhousie University, Halifax, N.S., http://napra.ca/Content_Files/Files/change.pdf, accessed June 2017.

The use of scenarios/vignettes could help professionals to better define the context of behavioural performance and formulate their intentions and opinions more accurately. Consequently, the validity of the self-reporting tools to assess healthcare professionals' skills could be strengthened and the findings would be more relevant to inform policy interventions.

6.2.3. Module on skills use

The internal consistency of the self-reporting tools can be further strengthened by adding a module on skills use. As mentioned above, most of the skills assessment instruments recognise that organisational barriers might affect skills use by professionals in daily front-line practice. Therefore, these instruments include an additional self-reporting module, which consists of questions about skills use and/or organisational barriers to skills use (perceived behavioural control).

Skills use is assessed by questions about the frequency with which tasks requiring certain skills are performed. The organisational barriers to skills use, i.e. to performance of these tasks, are usually elicited by asking the respondents to select them from a predefined list of potential barriers such financial (dis)incentives, lack of managerial support for certain behaviours, or unsupportive organisational culture. In the above-described example of pharmacists' survey, the respondents were asked to indicate (using Likert scale) how easy or difficult it was for them to perform each of the tasks for one patient who regularly obtained medication in their practice (Farris & Schopflocher, 1999).

Developers of other questionnaires – not explicitly dedicated to skills assessment - propose asking the respondents to rate how supportive/unsupportive their managers, supervisors, mentors or colleagues would be of certain behaviours (Beatty & Beatty, 2004). These types of questions shed light on obstacles to skills use related to organisational culture and perceived norms in the work place.

Moreover, a number of national surveys of physicians and nurses that focus on measuring work satisfaction include questions on skills use which probe frequency with which certain types of tasks are performed. Also, general workforce surveys – for instance the European Working Conditions Survey (Eurofound, 2012) or the European Skills and Jobs Survey (Cedefop, 2015) - include questions on the use of certain skills in the workplace.

The above-described surveys provide a rich repository of questions assessing skills use and form a useful basis for a development of an international self-reporting instrument. From the perspective of informing policy, the recommended approach would be to combine the questions about frequency of skills use with questions on various types of organisational barriers to skills use in the work place, including questions probing organisational culture and perceived norms at work place.

6.3. Direct skills assessment tools

Tools for direct assessment of transversal skills include examinations or tests performed by respondents in the presence of trained interviewers or raters as well as observation of actual performance by trained observers. Direct assessment tools have

the potential to deliver more objective assessment of skills than the self-reporting tools, but are relatively more complex and expensive both, with regard to costs of administration as well as costs of continuous updating to reflect the changes in practice. Direct assessment tools require participation and training of third parties, such as observers or raters. As with self-reporting, direct assessment methods also carry risk of bias, so it is critical to control for biases and unfairness in scoring under these methods (Jepsen, Ostergaard, & Dieckmann, 2015). Direct observation also carries with it the risk of Hawthorne effect, i.e. the alteration of behaviour by the subjects of a study due to their awareness of being observed.

6.3.1. Direct skills assessment tools based on examinations/tests

The development of direct assessment tools based on examinations/tests has been focused on measuring higher-order cognitive constructs such as understanding of concepts or texts, numerical skills, and problem-solving skills. Such instruments are valuable yet challenging to develop and apply. The higher-order cognitive constructs are particularly difficult to measure as they often consist of multiple interdependent, sometimes cyclic or chained, cognitive operations, i.e. individuals continuously make a number of intermediate decisions before arriving at a final decision. These dynamics are difficult to capture (Dickison, et al., 2016).

Higher-order cognitive constructs, such as problem solving, cannot be measured with observational tools because respondents' internal cognitive processes are not directly observable. Self-reporting tools, relying on questions and statements, to which the respondents express their agreement or disagreement, also fall short in capturing these processes. Therefore the most suitable tools are direct examinations or tests using a series of multiple-choice or open-ended response questions related to a scenario-based task. These tests are usually computer-based and completed by respondents in the presence of trained interviewers or raters. The raters provide various types of information necessary for completing the test and also ensure that certain conditions are fulfilled – for instance, the respondents are usually not allowed to consult others while taking the test.

In this type of assessment instrument, the test items are multiple-choice or open-ended response questions related to a scenario-based task. The design of the test items and the scenario-based tasks is focused less on evaluating the mastery of certain contents and more on the ability to use information provided by the examiner to find solutions in a variety of real-world situations. The test items are organised in sequence by growing complexity, and the respondent will work through the problem according to their capacity. The results are evaluated in terms of the level of complexity that the respondent was able to tackle, but there is no threshold that separates those who have the competency in question from those who do not (OECD, 2012).

At present, there are no health workforce-specific direct assessment tools for transversal skills based on examinations. This type of tool is being developed for the purpose of assessment of clinical reasoning skills among nurses by National Council of State Boards of Nursing in the United States (Dickison, et al., 2016). The tool is currently in the testing phase and could potentially serve as the foundation for development of a corresponding tool for the assessment of transversal skills of all health professionals.

There are, however, a number of international tools based on examinations used for the assessment of cognitive skills of the general working adult population. One of the most advanced international tests is the OECD Survey of Adult Skills (PIAAC), in which skills in numeracy, literacy, and problem-solving (in standard or technology rich environment) are assessed through a computer-based or paper test. An additional PIACC module for the assessment of adaptive problem-solving skills in technology-rich environments is currently under development, with the aim of being deployed in the next round of PIAAC assessment in 2021. The experience of PIAAC offers rich background to inform the development of direct assessment tools for the adaptive problem solving skills of health professionals and associate professionals (OECD, 2012).

Thus, conceptual models for designing the test items for measuring higher-order cognitive constructs are well-developed (OECD, 2012; Dickison, et al., 2016) and can serve as the basis for the design of test items suitable for measuring constructs such as adaptive problem-solving skills, as described in Section 5.3.2. Moreover, the experience of the OECD Survey of Adult Skills (PIAAC) in 24 countries, illustrates possibility to design test items that meet standards of international comparability.

The fact that the tests assess, among others, the ability to use certain tools to perform information-processing tasks makes these instruments particularly suitable for assessing ICT skills, i.e. the ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with or influence others, and perform tasks in work setting. In other words, the direct assessment tools based on examinations can serve not only assessment of adaptive problem solving skills but are also suitable tools for advanced assessment of ICT literacy.

6.3.2. Direct skills assessment tools based on observation of actual behaviour

Tools for direct assessment of actual performance by trained observers have been developed and widely used in educational institutions preparing health professionals. Observational tools often rely on a simulated situation using "standard patients", in which an actor simulates a patient care scenario, to which an individual student/candidate or a team respond. The observer assesses the candidate's skills using a structured tool describing the candidate's responses and behaviours (Baig, Violato, & Crutcher, 2009).

Observational tools have been used extensively to assess transversal skills related to communication and team work. Most evolved from the aviation industry, where skills related to effective communication and team work are crucial for maintaining safety. Therefore, the majority of the observational instruments for health professionals enact scenarios such as the operating room or emergency situations (Jepsen, Ostergaard, & Dieckmann, 2015; Kapur, Parand, Soukup, Reader, & Sevdalis, 2015). Nevertheless, these instruments offer a model for development of direct observational assessment tools for team work in less urgent situations, such as a team developing an interprofessional care plan for a complex patient in a nursing home.

Indeed, direct assessment based on observation of actual behaviour is the only tool that allows for capturing the entire team dynamics and performance. It also allows for more complete assessment of an individual's teamwork skills since they are not

only reflected by the individual's behaviour but also by reactions of other team members to that behaviour. Therefore, for the purpose of the Survey, these tools could be considered as an additional assessment of skills related to teamwork, along with the assessment relying on the self-reporting surveys.

It is important to recognise, however, that these tools are also subject to bias on the respondents' part, similarly to the self-reporting survey tools. In assessing the observed behaviour, one cannot exclude a contribution of the ''Hawthorne effect'' of close observation on performance, which is a process where the observed subjects change their behaviour simply because they are being studied. In order to minimise the ''Hawthorne effect'', the assessment exercise would have to carried out repeatedly as the effect is expected to fade with time. This is one of the factors that contribute to the relatively high cost of the application of the observational tools.

Moreover, observational instruments might be subject to value judgement on the observers' part (Cowan, Wilson-Barnett, & Norman, 2007). Indeed, specific skills are required to make observations and to provide constructive feedback to participants. Thus the implementation of the observational tools would depend on providing a training to the observers such that they can acquire the ability to use the tools effectively (Jepsen, Ostergaard, & Dieckmann, 2015). The costs of the observer training add to the costs of the assessment, making the observational tools the most expensive option for skills assessment. Additionally, these instruments might pose challenges in terms of ensuring international comparability. For instance, in practice, it is not feasible to use the same observers across different countries due to language barriers among other factors. Using different observers across countries might create a bias related to cultural differences.

Also, the observational assessment tools have been predominantly developed by researchers with the same professional background as the target group of healthcare personnel involved – for example, anaesthesiologists develop instruments for assessment of skills of other anaesthesiologists. Occasionally, development of some of the instruments involved also psychologists. Therefore, further adaptation and refinements of the observational tools should be based on the questions whether other stakeholders besides target group and psychologists should be involved. The other stakeholders could include other health professionals and health associate professionals and, last not least, patients and their families/carers. As discussed earlier in the report, the perception of proficiency with respect to a given skill set depends on a frame of reference, which might differ significantly between the various stakeholders.

6.4. Survey sampling and administration

6.4.1. Sampling strategies

At its simplest, the assessment can be directed at representative samples of various categories of health professionals and associate health professionals in each country (population sampling). The relevant categories of professionals could be identified using International Standard Classification of Occupations - ISCO-08 group - excluding the sub-occupations in veterinary areas (ILO, 2012). This approach has the advantage of simplicity and thus lower cost. Its major disadvantage is the difficulty in "connecting the dots" with other assessment activities and research aimed at service improvement or policy development.

Alternatively, the assessment could use two-stage sampling, in which first a representative sample of organisations (e.g. hospitals or clinics) or geographical units (e.g. counties or regions) is selected in each country, followed by representative sampling of professionals within each organisation or geographical unit. Two-stage sampling would allow skills assessment surveys to include an additional module directed to managers of the organisations to gauge their perspective on skills gap and skills mismatch. This could be especially helpful in providing feedback from employers on current and future skills needs which can guide a comprehensive policy response to the problem of skills mismatch. Questionnaires serving this purpose in the general labour market have been developed in for example Finland, Sweden, and the United Kingdom, as well as by the International Labour Organisation. Such an additional module for the managers could increase policy-relevance by relating skills gaps from the workers perspective against those of the managers, as well as reported barriers to skills use from the employer perspective.

Box 12 - TALIS International sampling plan

The OECD Teaching and Learning International Survey (TALIS) is the largest international survey of teachers' professional development, satisfaction with their jobs, school working climate, and their feelings about their professional abilities. The international sampling plan prepared for the TALIS core survey is a stratified two-stage probability sampling design. This means that first a sample of randomly selected schools (primary sampling units) is chosen in each country and then teachers (secondary sampling units) are randomly selected from the list of in-scope teachers in each of the randomly selected schools. Thus, coverage of TALIS extends to teachers as well as to the principals of the schools where they teach. TALIS identifies policy issues that encompass the teacher, the classroom, the school and school management.

To allow for reliable estimation and modelling, while allowing for some amount of non-response, the standard sample size in TALIS was set at 200 schools and 20 teachers within each school. Participating countries could choose to augment their national sample according to the number of schools available for sampling. In particular, TALIS recognised that attempting to survey teachers in very small schools could be a costly, time-consuming and statistically inefficient exercise. Therefore, participating countries were allowed to exclude very small schools for TALIS data collection, thus creating a national survey population different from the national target population. The countries were required to document the reasons for exclusion. Participating countries could also suggest variations or adaptations of the international sampling plan to better suit their national needs. The international sampling plan did not anticipate any stratification of the schools nor of the teachers within the selected schools. Participating countries that chose to implement some form of stratification to answer national requirements were invited to discuss their strategy with the TALIS sampling team. In most cases, stratification resulted in a combination of some or all of geography, source of financing, type of educational programme and size of schools.

Source: OECD. (2014). *Talis 2013 Results: An International Perspective on Teaching and Learning*. Paris: OECD Publishing.
Retrieved from http://dx.doi.org/10.1787/9789264196261-en

Two-stage sampling also allows options for linking the results of skills assessment survey with other surveys that are targeted at the organisations as the observational units of interest. Thus, a two-stage sampling results can show the influence on performance of organisation and system-level factors at a workplace as well as individual factors. This is the approach used with the OECD Teaching and Learning International Survey (TALIS), which is the largest international survey of teachers' professional development, classroom and school working climate, satisfaction with their jobs, and their feelings about their professional abilities (OECD, 2014). TALIS illustrates the advantages of two-stage sampling for generating policy-relevant data. Two-stage sampling allows accounting for influence of not only individual factors on performance at a workplace but also organisation-level factors, including the management style of principals (see Box 12, above).

The two-stage sampling would also allow skills assessment surveys to be linked with other measures that are reported at the organisational level as the observational units of interest. These include routinely collected performance indicators as well as surveys on patient reported experience measures (PREMs) and patient reported outcome measures (PROMs) that are also usually conducted at a provider/organisation level. PREMS and PROMs potentially measure important outcomes of the health professionals' skills and skills use, especially in the context of personalised and integrated model of care. These indicators will offer important and complementary measures of the effectiveness of the health care provider, including the health workers, in achieving the objectives of a person-centred care. Thus, a two-stage sampling approach has the potential of generating additional policy-relevant evidence on the effects of skills gap and skills mismatch on health systems performance.

Figure 11, below, summarises the list of instruments that could be considered in the skills assessment approach. The approach distinguishes those instruments that are administered at the individual level, and those administered at organisational levels.

Figure 11 - Overview of Health Workforce Skills Assessment Survey Approach
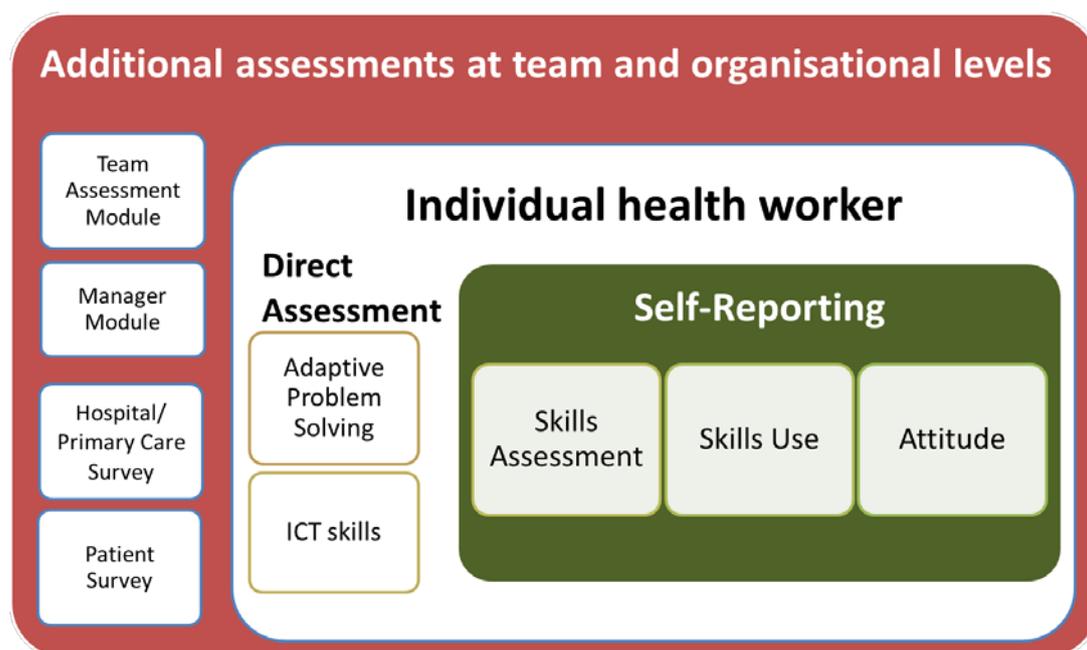
6.4.2. Sampling frame and sample size

As discussed in Section 3, the target population in each country are health professionals and associate health professionals as identified by ISCO-08 group of International Standard Classification of Occupations, excluding the sub-occupations in veterinary areas (ILO, 2012). Whether all categories of the professionals or a subset participate in the survey can be decided in the implementation phase, depending on each country's priorities.

The sample size will need to be decided at the implementation stage as it will depend on a number of factors, including: (i) the size of the population of a given category of professionals in a country; (ii) the comprehensiveness of the sampling frame, i.e., the professional registers; (iii) the country's priorities in terms of skills assessment by different target population – by professional category, age groups, gender, or other criteria for stratification; (iv) the number of skill sets that should be subject to assessment; and (v) the number of languages in which the assessment should be applied within a country.

Furthermore, the sample size will depend on the choice of sampling framework and survey administration, particularly how many modules of the assessment each survey participant will be required to complete. In general, the recommended administration methods are online surveys, for instruments relying on self-reporting, and computer-based tests for direct assessment tools relying on examinations in the presence of trained raters. For any of the above-discussed instruments, a respondent can be asked to complete all questions/test items/tasks related to all skills sets covered by the assessment, or only a subset of questions/tests items/tasks. The latter option reduces burden on individual respondents and could increase response rate. However, this will necessitate a larger sample size.

7. Conclusion and Next Steps

7.1. Key Findings

Meeting the challenges of demanding and complex health care workplaces. Increasingly, health workers need adaptive problem-solving skills to respond to complex and non-routine patient care issues, as well as to complex, multi-disciplinary and frequently stressful working environments. For the foreseeable future, countries will need *resilient and flexible* health workers who are armed not only with technical and clinical skills, but with cognitive, self-awareness and social skills that enable them to monitor and assess unfamiliar situations, make decisions, take leadership roles, and communicate and co-ordinate their actions within teams in order to achieve high levels of patient safety and efficiency as well as to assure their own safety and job satisfaction.

Convergence of transversal skills. Internationally, we find a remarkable convergence of the types of skills that are recognised as important across different categories of health professionals from different countries. These cross-cutting skills include *interpersonal skills, such as communication, teamwork, self-awareness and openness to* continuous learning, and *analytical skills* such as adaptive problem-solving skills to devise customised care for individual persons and the ability to use ICT effectively. These *transversal skills* reflect the shared competencies of all health professionals as they perform the increasingly complex tasks of actively engaging individuals in their own health care while personally adapting to continuous advances in technology and changes in professional expectations. The emerging convergence of these transversal skills across disciplines points to the feasibility of developing a skills assessment instrument that could be applied to all categories of health professionals and across different health systems.

Need for a comprehensive approach to assess skills shared by all health professionals. Many skills assessment instruments exist to measure specialised and technical skills of different categories of health professionals; however, these assessment tools are predominantly developed and used by health professional associations and professional regulatory bodies for licensing and certification purposes. Due to this segmentation, available instruments are generally designed to measure the qualification of a specific health professional group and focused on a particular aspect of healthcare performance, and do not lend themselves easily to system-wide assessments of skills across all categories of health professionals. At the other end of the spectrum, more generalised skills assessment surveys such as OECD's Programme for International Assessment of Adult Competencies (PIAAC) designed for the entire adult population offer internationally standardised approach to skills assessment, but they are too broad for probing into sector-specific issues.

Need for a systems-relevant approach. The existing skills assessment instruments do not readily enable differentiation between the skills mismatch caused, on the one hand, by the inadequacies of the education and training system or, on the other hand, by inadequacies in the health care system. Such distinctions are necessary for employers and policy makers to determine appropriate courses of action. For example, should the focus be resources for the education of health professionals or for addressing system constraints that prevent workers from applying their skills?

Need to integrate person-centred perspectives. Since most of the existing skills assessment instruments have been developed from the perspective of the healthcare provider, they are generally not designed to reflect the perspectives of the individuals receiving care. To deliver seamless person-centred care, healthcare teams will need to be responsive to the varying needs of individuals across variable states of health, socio-cultural backgrounds and throughout progressive stages of life. These individuals will present diverse care needs, ranging from healthy persons seeking support for healthy lifestyles to acute and chronic care patients dealing with the consequences of illness or injury, and those from disadvantaged and marginalized people requiring socio-culturally sensitive care. To be policy relevant, future skills assessment instruments will need to incorporate the perspectives of those receiving care, and be able to measure the professionals' ability to cope with the consequences of this paradigmatic shift.

7.2. Recommendations

Although a large number of skills assessment instruments already exist in the health sector, there is considerable scope for improving the effectiveness of health professional skills assessment surveys to generate policy-relevant and actionable evidence.

Broaden the policy-relevance of skills assessment tools. At present, surveys are still developed primarily by the professional associations or regulatory bodies, and they appropriately reflect the priority concerns from their perspectives. However, this leaves gaps in designing skills assessment surveys that would have benefited from involvement of other groups, for example, to address issues such as interprofessional teamwork, or to deal with health workforce skills gap that have implications on the performance of payer agencies. Priority policies will need to be identified through active participation not only of interprofessional groups but also patient representatives, health policy makers, and other stakeholders (including payer representatives). These issues can be incorporated into survey questionnaires in the form of scenarios or vignettes which are locally adapted and reflect real-life cases likely to be faced by the health professionals and patients.

Focus on skills for person-centred care. The relevance of skills assessment surveys in promoting person-centred care would be enhanced significantly by actively involving patient groups and the general public. While many surveys incorporate skills identified as important for person-centred care (such as communication and teamwork), the use of the language and the design of questionnaires nevertheless reflect a predominantly provider perspective. By engaging patient groups from the design stage would help to bring the user-perspective in the final survey design.

Build on convergence of skills requirements. An internationally comparable skills assessment approach will need to establish comparable standards and consistency in terms of the functions and skills required for performing these functions, without being tied to a particular assignment of functions by categories of workers which are unique and specific to each country or health system. Skills assessment questions can be organised around a number of transversal skills that are recognised as relevant for all health professionals and could form the foundation for a more standardised approach. These core skills may include teamwork, communication, shared decision-making, socio-cultural sensitivity, awareness of professional and ethical standards,

workers' own safety and well-being, adaptive problem solving, health system awareness, and ICT literacy. Depending on the priorities of each country or entity, the assessment instrument could include all of these skill sets or a specific selection.

Choose an appropriate methodology to fit the survey objectives. Self-reported questionnaires are the most cost-effective instrument, and their value can be enhanced by including not only questions about self-assessment of skills but about the actual use of the skill at the workplace and the worker's attitude toward tasks involving particular skills. Direct assessment instruments are costly to develop and administer, but can add value if they are designed to address critical skills that are difficult to evaluate with self-reporting, such as team effectiveness and adaptive problem-solving. The choice of sampling frame will also be instrumental in relating the findings of the skills assessment instruments with other health sector performance measures, such as hospital surveys or patient surveys. By choosing an appropriate sampling framework, the results of the health professional skills could be correlated with the outcomes of other healthcare surveys which will significantly boost the power of their respective findings. Countries will need to determine whether the benefits of introducing a more complex sampling framework are worth the higher cost of designing and implementing this approach.

Involve stakeholders in the design of the survey instrument. The policy relevance and usefulness of the skills assessment survey will be enhanced significantly by involving the key stakeholders, including representatives of patient groups, professional associations, managers and policy makers in the design of the questionnaires and the identification of policy and practice relevant hypotheses to be tested by the survey. The involvement of the diverse group of stakeholders will help to enrich the content of the survey, as well as encourage greater collaboration and ownership among the stakeholders in finding appropriate solutions to these challenges.

7.3. Next Steps

In order to take the recommendations of this study towards implementation, we propose the following phased steps toward the development of a standardised Skills Assessment Survey for the Health Sector.

Supporting national level efforts to design health workforce skills surveys

Based on the findings and recommendations of this study, we encourage the countries to design and implement skills assessment surveys which are adapted to the local health system and policy concerns but also adhering to the common principles and approaches described in the study. This would help to validate the key hypothesis that it will be possible to identify a common competency framework with shared skill sets across different systems and different categories of health workers.

Developing a standardised assessment approach

Building on the results of the implementation of surveys in several countries and in different healthcare systems, the OECD Secretariat could work towards identifying the shared features across these different contexts, and propose a standardised survey approach that incorporates the experiences and lessons from multiple countries. This would benefit from the experience of PIAAC and TALIS which have established precedence in undertaking such an approach.

Accelerating innovative initiatives by key stakeholders

Given the urgency of reviewing the education and training requirements of health workers, collaboration between international organisations with health professional associations and patient groups in undertaking fast-track initiatives could make the tools more rapidly tested and made available.

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Annex 1- Expert Working Group Meeting, OECD Paris, on 7 February 2017

Name	Title/Position	Organization
Ronald Batenburg	Program Coordinator Health Workforce and Organization Studies	NIVEL (Netherlands Institute for Health Services Research)
Gilles Dussault	Professor	Institute of Hygiene and Tropical Medicine, University of Portugal
Robert Elliot	Professor	University of Aberdeen
Bernhard Gibis	Head, Provision of Health Care Services	National Association of Statutory Health Insurance Physicians (Kassenarztliche Bundesvereinigung)
Frances Hughes	Corporate Executive Officer	International Council of Nurses
Siv-Lise Bendixen Stærk	Specialist	Norwegian Ministry of Health and Care Services
Silje Anine Bell	Division Director	Norwegian Directorate of Health
Live Korsvold	Senior Advisor	Norwegian Directorate of Health
Magnus Göransson	Project Leader	National Board of Health and Welfare, Sweden
Nicolaas S. Klazinga	Senior Health Policy Analyst	Directorate for Employment, Labour and Social Affairs, OECD
Luke Slawomirski	Health Economist/Policy Analyst	Directorate for Employment, Labour and Social Affairs, OECD
Ian Brownwood	Health Policy Analyst	Directorate for Employment, Labour and Social Affairs, OECD
Francesca Borgonovi	Senior Analyst, Early Childhood and Schools	Directorate for Education & Skills, OECD
Kieran Walsh	Clinical Director	BMJ Learning
Stelina Chatzichristou	Expert, Department for Skills and Labour Market	European Centre for the Development of Vocational Training (CEDEFOP)
John H.V. Gilbert	Principal and Professor Emeritus	University of British Columbia
Roger Strasser	Professor of Rural Health, Dean and CEO	Northern Ontario School of Medicine
Gail Tomblin-Murphy	WHO Collaborating Center	Dalhousie University

Annex 2 - Stakeholder Meeting, OECD Paris, on 8 February 2017

Name	Organization
Patrick Romestaing	Standing Committee of European Doctors (CPME)
Ber Oomen	European Specialists Nurses Organisations (ESNO)
Jamie Wilkinson	Pharmaceutical Group of the European Union
Antonio Grasso	Pharmaceutical Group of the European Union
Lise Carratala	European Union of Medical Specialists (UEMS)
Anne-Marie Felton	Foundation of European Nurses in Diabetes
Konstantinos Aligiannis	European Federation of Nurses Association
Miguel Lardennois	Federal Public Service Health, Food Chain and Environment, Belgium
Veronika di Cara	Czech Nurses Association
Marjukka Vallimies-Patomäki	Ministry of Social Affairs and Health, Finland
Virginie Delattre-Escudie	General Directorate for Healthcare Services (DGOS), France
Paolo Michelutti	Ministry of Health, Italy
Justina Januseviciene	Ministry of Health, Lithuania
Aleksandra Kotowicz	Ministry of Health, Poland
Martin Sparr	National Board of Health and Welfare, Sweden
Cris Scotter	Department of Health, UK
Siv-Lise Bendixen Stærk	Ministry of Health and Care Services, Norway
Silje Anine Bell	Norwegian Directorate of Health
Live Korsvold	Norwegian Directorate of Health
Robert Elliot	University of Aberdeen
David Gorria Cardesa	European Region of the World Confederation of Physical Therapy
Carlos J. Moreno Sánchez	Ministry of Health, Social Services and Equality, Spain
David Gorria	European Region of the World Confederation for Physical Therapy (WCPT)

Annex 3 - List of persons who participated in in-depth interviews (July – August 2017)

1. Lise Carratala, EU Policy and Administrative Officer, European Union of Medical Specialists

2. Stelina Chatzichristou, Expert, Department for Skills and Labour Market, European Centre for the Development of Vocational Training (CEDEFOP)

3. Paul de Raeve, Secretary General, European Federation of Nurses Association

4. Gilles Dussault, Professor, Institute of Hygiene and Tropical Medicine, University of Portugal

5. Robert Elliot, Professor, University of Aberdeen

6. Bernhard Gibis, Head, National Association of Statutory Health Insurance Physicians (Kassenarztliche Bundesvereinigung)

7. John H.V. Gilbert, Principal and Professor Emeritus, University of British Columbia

8. Judith Holt, Co-Director, Utah Neurodevelopmental Disabilities Program, Utah State University

9. Frances Hughes, CEO, International Council of Nurses

10. Kaisa Immonen Policy Specialist, European Patient Forum

11. Aleksandra Katowicz (written response), Senior Specialist, Department of Science and Higher Education, Ministry of Health, Poland

12. Usman Khan, Director of Professional Affairs, European Health Management Association

13. Jonathan Kruger, President, World Confederation for Physical Therapy

14. Ellen Kuhlmann, Researcher, University of Frankfurt

15. Carlos J. Moreno Sánchez, Ministry of Health, Social Services and Equality, Spain

16. Ber Oomen, Executive Officer and Treasurer, European Specialists Nurses Organisations (ESNO)

17. Patrick Romestaing, Vice President, Rapporteur on health workforce policy, Standing Committee of European Doctors (CPME)

18. Kenichiro Taneda, Senior Researcher, National Institute of Public Health, Japan

19. Marjukka Vallimies-Patomäki, Ministry of Social Affairs and Health, Ministry of Social Affairs and Health, Finland

20. Kieran Walsh, Clinical Director, BMJ Learning, UK

21. Jo Walton, Professor in Nursing, Graduate School of Nursing, Midwifery & Health, Victoria University of Wellington, New Zealand

22. Jamie Wilkinson, Director of Professional Affairs, Pharmaceutical Group of the European Union

23. Melissa Ye, Avant Mutual Group (Medical Indemnity Insurance), Australia

24. Gail Tomlin Murphy, WHO/PAHO Collaborating Centre on Health Workforce Planning & Research, Dalhousie University, Halifax

25. Philip Dickison, National Council State Boards of Nursing (NCSBN), United States

The OECD team also participated in the health workforce skills assessment workshop on 28 April 2017 organised by the Swedish National Board of Health and Welfare, and attended by the representatives from Norway's Directorate of Health. We presented the proposed methodology for the skills assessment, and received valuable feedback from the participants. We would like to thank Mr. Martin Spurr, Head, Department of Evaluation and Analysis, System Analysis, National Board of Health and Welfare, Sweden; and Ms. Silje Anine Bell, Division Director and Ms. Live Korsvold, Senior Advisor, Directorate of Health of Norway.

Annex 4 – Description of Programme for International Assessment of Adult Competencies (PIAAC)

The Programme for the International Assessment of Adult Competencies (PIAAC) developed and conducts the Survey of Adult Skills. The survey measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments - and gathers information and data on how adults use their skills at home, at work and in the wider community. This international survey is conducted in over 40 countries and measures the key cognitive and workplace skills needed for individuals to participate in society and for economies to prosper. This Annex provides a brief summary of the types of skills covered and the instruments used to measure those skills under PIAAC.

The survey instruments administered under PIAAC consist of (a) direct and indirect assessment of skills; and (b) survey on the use of skills on the job. Box 13, below, summarises the assessment instruments developed under PIAAC.

The types of cognitive and non-cognitive skills covered under PIAAC are described in Table 8, below. These skills have been developed for the general workforce, and could be used as a starting point for identifying common skills requirements across the health workforce. Additional skills may need to be identified to address the specific needs of the health care professionals. For example, a more detailed set of non-cognitive skills may be required to address the behavioural and psycho-social needs of the patients, such as the ability to empathize and build trust. Many of the skills assessment instruments developed for medical and nursing professionals already include such modules that could be introduced into a more generalized approach for the healthcare professionals.

Box 13 - Summary of PIAAC Instruments

A. The Survey of Adult Skills

This survey includes a direct assessment of skills obtained by:

- interviewing adults aged 16 to 65 in their homes – 5000 individuals in each participating country
- answering questions via computer, although the survey can also be implemented via pencil-and-paper
- directly assessing (i) literacy skills, (ii) numeracy skills, and (iii) the ability to solve problems in technology-rich environments

The survey also collects a broad range of *background information*, including how skills are used at work and in other contexts, such as the home and the community. The survey is designed to:

- Be valid cross-culturally and cross-nationally
- Enable countries to administer the survey in their national languages and still obtain comparable results
- Provide comparative analysis of skill-formation systems and their outcomes, and international benchmarking regarding adult skills
- Be repeated over time to allow policy makers to monitor the development of key aspects of human capital in their countries.

B. Module on Skills Use

The Survey of Adult Skills uses an innovative "job-requirements approach" to ask adults who are employed about a number of generic skills they use in the workplace. The survey asks adults how intensively and how frequently they use these skills at work. Information is also collected about four broad categories of generic work skills:

(i) Cognitive skills encompass reading, writing, mathematics and the use of information and communication technologies.

(ii) Interaction and social skills cover collaboration and co-operation, planning work and use of time for oneself and others, communication and negotiation, and customer contact.

(iii) Physical skills involve the use of gross and fine motor skills.

(iv) Learning skills cover activities such as instructing others, learning (formally or informally), and keeping up-to-date with developments in one's professional field.

In addition all respondents are asked about the frequency and intensity of their reading and numeracy related activities as well as their use of ICTs at home and in the community.

Source: OECD, website *http://www.oecd.org/skills/piaac/*

Table 8 - Key competencies and skills covered in the Survey of Adult Skills (PIAAC)

Key competencies and skills covered in the Survey of Adult Skills (PIAAC)

Key competencies	Measured directly in the Survey of Adult Skills (PIAAC)	Measured indirectly (through self-reports) in the Survey of Adult Skills (PIAAC)
Cognitive competencies		
Communication	Literacy (reading)	Reading and writing (work and personal life)
Information processing		
Problem solving	Problem solving in technology-rich environments	Problem solving (work)
Learning		Learning activities (work) Deep learning
Mathematics	Numeracy	Numeracy activities (work and personal life)
Intra and interpersonal competencies		
Interpersonal		Collaboration, influencing (work) Trust in others
Self-regulation		Learning style
Management		Organisation/planning (work)
Creativity/entrepreneurship		
Technological competencies		
ICT	Literacy (digital reading), problem solving in technology-rich environments, ICT core test	ICT use (work, everyday life)

Source: Table 7.2 (OECD, 2013)

Job-related items are included for the three central domains covered by the direct assessments (literacy, numeracy and ICT), as well as the areas of problem solving and a range of interaction/social skills (influence, managerial skills, communication skills) and physical skills (strength and manual skill). Table 9, below, provides the list of skills covered under the Job-Related Approach module. Besides skill use in these domains, items are included that indicate the level of computer skills required in the respondent's job. Adding the skill use items in the domains that are also being directly tested will make it possible to generate indicators of skills mismatch.

Table 9 - Skills Use Indicators

Indicator	Group or tasks
Information Processing Skills	
Reading	Reading documents (directions, instructions, letters, memos, e-mails, articles, books, manuals, bills, invoices, diagrams, maps).
Writing	Writing documents (letters, memos, e-mails, articles, reports, forms)
Numeracy	Calculating prices, costs or budgets; use of fractions, decimals or percentages; use of calculators; preparing graphs or tables; algebra or formulas; advanced math or statistics (calculus, trigonometry, regressions)
ICT	Using e-mails, internets, word processors, program languages, conducting transactions online; participating in online discussions.
Problem solving	Facing hard problems (at least 30 minutes of thinking to find a solution)
Other Generic/Transversal Skills	
Task discretion	Choosing or changing sequence of job tasks, the speed of work, working hours; choosing how to do the job
Learning at work	Learning new things from supervisors or co-workers; learning-by-doing; keeping up to date with new products or services
Influencing skills	Instructing, teaching or training people; making speeches or presentations; selling products or services; advising people; planning others' activities; persuading or influencing others; negotiating
Co-operative skills	Co-operating or collaborating with co-workers
Self-organizing skills	Organizing time
Physical skills (gross)	Working physically for a long period
Dexterity	Using skill or accuracy with hands or fingers

Source: Table 2.6 (OECD, 2013)

Annex 5

The appendix contains selected examples of existing self-reporting questionnaires used for assessment of various transversal skills and skill use. These instruments can be used as a background material in the development of an international self-reporting skills assessment instrument.

Example 1 – Questionnaires measuring attitudes towards and skills related to teamwork (self-assessment)

Example 2 - Questionnaires measuring attitudes and skills related to teamwork and interprofessional collaboration (an individual's assessment of a whole team)

Example 3 - Questionnaires measuring attitudes and skills related to team structure, leadership, communication, and stress management through mutual support within a team

Example 4 – A questionnaire measuring pharmacists' attitudes, skills, and perceived barriers to skill use regarding patient-centred care (self-assessment)

Example 5 – A questionnaire measuring occupational health & safety attitudes in ambulatory care (self-assessment)

Example 6 - A questionnaire measuring shared decision making knowledge and skills (self-assessment)

Example 7 - A questionnaire measuring attitudes, skills, and knowledge in cultural competency

Example 1

Attitudes Toward Health Care Teams Scale (ATHCT)[7]

We would like to know about your attitudes toward interdisciplinary health care teams and the team approach to care. By **interdisciplinary health care team, we mean three or more health professionals (e.g., nurse, physician, social worker) who work together and meet regularly to plan and coordinate treatment for a specific patient population**.

"IN MY OPINION"	Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
Working in teams unnecessarily complicates things most of the time.	O	O	O	O	O	O
The team approach improves the quality of care to patients.	O	O	O	O	O	O
Team meetings foster communication among team members from different disciplines.	O	O	O	O	O	O
Physicians have the right to alter patient care plans developed by the team.	O	O	O	O	O	O
Patients receiving team care are more likely than other patients to be treated as whole persons.	O	O	O	O	O	O
A team's primary purpose is to assist physicians in achieving treatment goals for patients.	O	O	O	O	O	O
Working on a team keeps most health professionals enthusiastic and interested in their jobs.	O	O	O	O	O	O
Patients are less satisfied with their care when it is provided by a team.	O	O	O	O	O	O
Developing a patient care plan with other team members avoids errors in delivering care.	O	O	O	O	O	O
When developing interdisciplinary patient care plans, much time is wasted translating jargon from other disciplines.	O	O	O	O	O	O
Developing an interdisciplinary patient care plan is excessively time consuming.	O	O	O	O	O	O

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[7] All rights reserved. Based on Heinemann, Schmitt and Farrell (1994). Attitudes Towards Interdisciplinary Teams.

The physician should not always have the final word in decisions made by health care teams.	O	O	O	O	O	O
The *give and take* among team members help them make better patient care decisions.	O	O	O	O	O	O
The team approach makes the delivery of care more efficient.	O	O	O	O	O	O
The team approach permits health professionals to meet the needs of family caregivers as well as patients.	O	O	O	O	O	O
Having to report observations to the team helps team members better understand the work of other health professionals.	O	O	O	O	O	O

Team Skills Scale (a self-assessment measure)[8]

Please rate **your ability to carry out each of the following tasks**:

	Poor	Fair	Good	Very Good	Excellent
Function effectively in an interdisciplinary team	O	O	O	O	O
Identify contributions to patient care that different disciplines can offer	O	O	O	O	O
Ensure that patient/family preferences/goals are considered when developing the team's care plan	O	O	O	O	O
Handle disagreements effectively	O	O	O	O	O
Strengthen cooperation among disciplines	O	O	O	O	O
Carry out responsibilities specific to your discipline's role on a team	O	O	O	O	O
Participate actively at team meetings	O	O	O	O	O
Develop an interdisciplinary care plan	O	O	O	O	O
Adjust your care to support the team goals	O	O	O	O	O
Develop intervention strategies that help patients attain goals	O	O	O	O	O
Recognize when the team is not functioning well	O	O	O	O	O
Help draw out team members who are not participating actively in meetings	O	O	O	O	O

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[8] Based on Hepburn, Tsukuda, and Fasser (1996), Team Skills Scale, all rights reserved.

Example 2

Assessment of Interprofessional Team Collaboration Scale II (AITCS-II)
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Instructions:
*Please **circle the value** which best reflects how you currently feel your team and you, as a member of the team, work or act within the team. **A team can be defined as any interactions between one or more health professionals on a regular basis for the purposes of providing patient care.***

| ------------------------ | ------------------------------ | ------------------------------ | ------------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Never | Rarely | Occasionally | Most of the time | Always |

Section 1: PARTNERSHIP

When we are working as a **team** all of my team members…..

1.	include patients in setting goals for their care	1	2	3	4	5
2.	listen to the wishes of their patients when determining the process of care chosen by the team	1	2	3	4	5
3.	meet and discuss patient care on a regular basis	1	2	3	4	5
4.	coordinate health and social services (e.g. financial, occupation, housing, connections with community, spiritual) based upon patient care needs	1	2	3	4	5
5.	use consistent communication with to discuss patient care	1	2	3	4	5
6.	are involved in goal setting for each patient	1	2	3	4	5
7.	encourage each other and patients and their families to use the knowledge and skills that each of us can bring in developing plans of care	1	2	3	4	5
8.	work with the patient and his/her relatives in adjusting care plans	1	2	3	4	5

Section 2: COOPERATION

When we are working as a **team** all of my team members…..

9.	share power with each other	1	2	3	4	5
10.	respect and trust each other	1	2	3	4	5
11.	are open and honest with each other	1	2	3	4	5
12.	make changes to their team functioning based on reflective reviews	1	2	3	4	5
13.	strive to achieve mutually satisfying resolution for differences of opinions	1	2	3	4	5
14.	understand the boundaries of what each other can do	1	2	3	4	5
15.	understand that there are shared knowledge and skills between health providers on the team	1	2	3	4	5
16.	establish a sense of trust among the team member	1	2	3	4	5

Section 3: COORDINATION

When we are working as a **team** all of my team members…..

17.	apply a unique definition of *Interprofessional collaborative practice* to the practice setting	1	2	3	4	5
18.	equally divide agreed upon goals amongst the team	1	2	3	4	5
19.	encourage and support open communication, including the patients and their relatives during team meetings	1	2	3	4	5
20.	use an agreed upon process to resolve conflicts	1	2	3	4	5
21.	support the leader for the team varying depending on the needs of our patients	1	2	3	4	5
22.	together select the leader for our team	1	2	3	4	5
23.	openly support inclusion of the patient in our team meetings	1	2	3	4	5

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Interprofessional Collaboration Scale[9]

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. The team has a good understanding about their respective responsibilities.	O	O	O	O
2. Team members are usually willing to take into account the convenience of individuals when planning their work.	O	O	O	O
3. I feel that patient treatment and care are not adequately discussed between and among team members.	O	O	O	O
4. Individuals on the team share similar ideas about how to treat patients.	O	O	O	O
5. Team members are willing to discuss individuals' issues.	O	O	O	O
6. Team members cooperate with the way care is organized.	O	O	O	O
7. Team members would be willing to cooperate with new, agreed upon practices.	O	O	O	O
8. Individuals are not usually asked for their opinions.	O	O	O	O
9. Team members anticipate when they will need others' help.	O	O	O	O
10. Important information is always passed between and among team members.	O	O	O	O
11. Disagreements within the team often remain unresolved.	O	O	O	O
12. Some individuals think their work is more important than the work of others on the team.	O	O	O	O
13. Some individuals would not be willing to discuss new practices with other team members.	O	O	O	O

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[9] Kenaszchuk C, Reeves S, Nicholas D, Zwarenstein M. Validity and reliability of a multiple-group measurement scale for interprofessional collaboration. *BMC Health Services Research* 2010;10.

Team Fitness Test[10]

Rate each of the following statements as it applies to your team using the following rating scale:

This statement definitely applies to our team. 4
This statement applies to our team most of the time. 3
This statement is occasionally true for our team. 2
This statement does not describe our team at all. 1

Enter the score you believe appropriate for each statement beside the statement number on the Scoring Sheet.

_____ 1. Each team member has an equal voice.

_____ 2. Members make team meetings a priority.

_____ 3. Team members know they can depend on one another.

_____ 4. Our mandate, goals, and objectives are clear and agreed upon.

_____ 5. Team members fulfil their commitments.

_____ 6. Team members see participation as a responsibility.

_____ 7. Our meetings produce excellent outcomes.

_____ 8. There is a feeling of openness and trust in our team.

_____ 9. We have strong, agreed upon beliefs about how to achieve success.

_____ 10. Each team member demonstrates a sense of shared responsibility for the success of the team.

___ 11. Input from team members is used whenever possible.

___ 12. We all participate fully in team meetings.

___ 13. Team members do not allow personal priorities/agendas to hinder team effectiveness.

___ 14. Our roles are clearly defined and accepted as defined by all team members.

___ 15. Team members keep each other well informed.

___ 16. We involve the right people in decisions.

___ 17. In team meetings we stay on track and on time.

___ 18. Team members feel free to give their honest opinions.

___ 19. If we were asked to list team priorities, our lists would be very similar.

___ 20. Team members take initiative to put forth ideas and concerns.

___ 21. Team members are kept well informed.

___ 22. We are skilled in reaching consensus.

___ 23. Team members respect each other.

___ 24. When making decisions, we agree on priorities.

___ 25. Each team member pulls his or her own weight.

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[10] Geriatric Interdisciplinary Team Training Program: John A. Hartford Fdn: http://www.gittprogram.org/index.html

Collaboration and Satisfaction about Care Decisions (CSACD)

These questions are related to a decision to transfer a patient. Please circle the number that best represents your judgment about the team process and the decision.

1. Team members planned together to make the decision about care for this patient.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

2. Open communication among team members took place as the decision was made for this patient.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

3. Decision-making responsibilities for this patient were shared among team members.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

4. Team members cooperated in making the decision.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

5. In making the decision, all team members' concerns about this patient's need were considered.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

6. Decision-making for this patient was coordinated among team members.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

7. How much collaboration among team members occurred in making the decision for this patient?

1	2	3	4	5	6	7
No Complete Collaboration						Collaboration

8. How satisfied are you with the way the decision was made for this patient, that is with the decision making process, not necessarily with the decision itself?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied

9. How satisfied were you with the decision made for this patient?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied

Example 3

Team structure, Leadership, Mutual Support, and Communication Attitudes Questionnaire (T-TAQ)[11]

Instructions: Please respond to the questions below by placing a check mark (√) in the box that corresponds to your level of agreement from *Strongly Agree* to *Strongly Disagree*. Please select only one response for each question.

Team Structure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. It is important to ask patients and their families for feedback regarding patient care.					
2. Patients are a critical component of the care team.					
3. This facility's administration influences the success of direct care teams.					
4. A team's mission is of greater value than the goals of individual team members.					
5. Effective team members can anticipate the needs of other team members.					
6. High performing teams in health care share common characteristics with high performing teams in other industries.					
Leadership	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
7. It is important for leaders to share information with team members.					
8. Leaders should create informal opportunities for team members to share information.					
9. Effective leaders view honest mistakes as meaningful learning opportunities.					
10. It is a leader's responsibility to model appropriate team behavior.					
11. It is important for leaders to take time to discuss with their team members plans for each patient.					
12. Team leaders should ensure that team members help each other out when necessary.					
Situation Monitoring	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
13. Individuals can be taught how to scan the environment for important situational cues.					

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[11] Teamwork Attitudes Questionnaire (T-TAQ). Content last reviewed April 2017. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/teamstepps/instructor/reference/teamattitude.html

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. Monitoring patients provides an important contribution to effective team performance.					
15. Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.					
16. It is important to monitor the emotional and physical status of other team members.					
17. It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.					
18. Team members who monitor their emotional and physical status on the job are more effective.					
Mutual Support	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
19. To be effective, team members should understand the work of their fellow team members.					
20. Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.					
21. Providing assistance to team members is a sign that an individual does not have enough work to do.					
22. Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.					
23. It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.					
24. Personal conflicts between team members do not affect patient safety.					
Communication	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
25. Teams that do not communicate effectively significantly increase their risk of committing errors.					
26. Poor communication is the most common cause of reported errors.					
27. Adverse events may be reduced by maintaining an information exchange with patients and their families.					
28. I prefer to work with team members who ask questions about information I provide.					
29. It is important to have a standardized method for sharing information when handing off patients.					
30. It is nearly impossible to train individuals how to be better communicators.					

Example 4

Attitudes, Skills, and Organisational Barriers:
Pharmacists' adoption of novel elements of pharmaceutical care

Synthesis of questions used in studies assessing pharmacists' adoption of the patient-centred approach in pharmaceutical care

Attitudes (beliefs) towards the task/action:

How likely do you believe performing the following actions will help the patient and lead to improved adherence/health outcomes?

	extremely unlikely	unlikely	cannot say	likely	extremely likely
Identify patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the patient's desired goal(s)	O	O	O	O	O
Identify patient-specific drug-related problem	O	O	O	O	O
Obtain patient's social history	O	O	O	O	O

Skills (self-efficacy) self-assessment:

How confident are you that you can successfully perform the following tasks?

	extremely not confident	not confident	cannot say	confident	extremely confident
Identify the patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the patient's desired goal(s)	O	O	O	O	O
Identify the patient-specific drug-related problem	O	O	O	O	O
Obtain the patient's social history	O	O	O	O	O

Perceived organisational barriers to skills use (behavioural control):

1. How easy/difficult would it be to perform each of the tasks in your pharmacy?

	extremely difficult	difficult	cannot say	easy	extremely easy
Identify the patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the patient's desired goal(s)	O	O	O	O	O
Identify the patient-specific drug-related problem	O	O	O	O	O
Obtain the patient's social history	O	O	O	O	O

2. The manager in the pharmacy would think I should identify the patient's desired therapeutic goal(s)... Identify the therapeutic alternatives to meet the patient's desired goal(s)... identify the patient-specific drug-related problem... obtain patient's social history.

	extremely unlikely	unlikely	cannot say	likely	extremely likely
Identify the patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the the patient's desired goal(s)	O	O	O	O	O
Identify the patient-specific drug-related problem	O	O	O	O	O
Obtain the patient's social history	O	O	O	O	O

3. My colleagues in the pharmacy would think I should identify the patient's desired therapeutic goal(s)... Identify the therapeutic alternatives to meet the patient's desired goal(s)... identify the patient-specific drug-related problem... obtain patient's social history.

	extremely unlikely	unlikely	cannot say	likely	extremely likely
Identify the patient's desired therapeutic goal(s)	O	O	O	O	O
Identify the therapeutic alternatives to meet the patient's desired goal(s)	O	O	O	O	O
Identify the patient-specific drug-related problem	O	O	O	O	O
Obtain the patient's social history	O	O	O	O	O

Example 5
Occupational health & safety attitudes in ambulatory care[12]

"IN MY OPINION"	Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
This office constructively deals with problem physicians and employees.	O	O	O	O	O	O
When my workload becomes excessive, my performance is impaired.	O	O	O	O	O	O
I am more likely to make errors in tense or hostile situations.	O	O	O	O	O	O
Fatigue impairs my performance during emergency situations (e.g., code or cardiac arrest).	O	O	O	O	O	O
I am less effective at work when I am fatigued.	O	O	O	O	O	O
Stress from personal problems adversely affects my performance.	O	O	O	O	O	O
Very high levels of workload stimulate and improve my performance.	O	O	O	O	O	O
Truly professional personnel can leave personal problems behind when working.	O	O	O	O	O	O
I have seen others make errors that had the potential to harm patients.	O	O	O	O	O	O
I have made errors that had the potential to harm patients.	O	O	O	O	O	O

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[12] Modak, I. et al.(2007), Measuring Safety Culture in the Ambulatory Setting: The Safety Attitudes Questionnaire—Ambulatory Version, *Society of General Internal Medicine*;22:1–5

Example 6

Self-Assessment of Shared Decision Making knowledge and skills[13]

This self-assessment survey will be used to help to understand how knowledge, belief and skills in shared decision making change over time. Thank you for completing the survey.

Please indicate in the table below your self-assessed skill/knowledge level for each competency listed. A description of each skill level is provided here:

	Level	Description
Unaware	1	At this stage you think that Shared Decision Making (SDM) skills/ techniques might be useful to you, but you don't know anything about them.
Aware	2	At this point you are learning about SDM skills/ techniques, perhaps by going on a training course, reading a book or informally from your supervisor or colleagues.
Informed	3	Now you are ready to look for suitable opportunities to put SDM into practice, but it will take conscious effort to use the new skills/ techniques.
Capable	4	You are now using SDM skills/ techniques routinely, and are consciously aiming to improve by other methods.
Recognised	5	People around you recognise the change in skill level and you are now so practised that the skill has moved from your conscious to subconscious level.

Skill or knowledge	**Level**
I understand the structure of a shared decision making consultation	
I am able to introduce a preference sensitive decision in a consultation	
I am able to explain why there is more than one treatment option	
I am able to portray the options and check for understanding	
I am able to elicit the patient's personal preferences	
I am comfortable with introducing decision support tools (within or outside the consultation)	
I am able to put into practice the skills I learned at the workshop	

1	I think involving patients in decisions about treatment and care is not a good idea	I think involving patients in decisions about treatment and care is probably a good idea	I think involving patients in decisions about treatment and care is definitely a good idea
Tick one box	☐	☐	☐
2	I think providing decision support tools such as patient decision aids or Brief Decision Aids (BDAs) is not a good idea	I think providing decision support tools such as patient decision aids or Brief Decision Aids (BDAs) is probably a good idea	I think providing decision support tools such as patient decision aids or Brief Decision Aids (BDAs) is definitely a good idea
Tick one box	☐	☐	☐

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[13] The Health Foundation, *MAGIC – Making good decisions in collaboration: Self-assessment of Shared Decision Making knowledge and skills*, 2013.

3	I do not have any of the skills to involve patients in decisions about treatment and care	I have some of the skills to involve patients in decisions about treatment and care	I have all of the skills to involve patients in decisions about treatment and care
Tick one box	☐	☐	☐
5	At present I do not involve patients in making decisions about treatment and care	At present I sometimes involve patients in making decisions about treatment and care	At present I routinely involve patients in making decisions about treatment and care
Tick one box	☐	☐	☐
6	In future I do not wish to involve patients in making decisions about treatment and care	In future I would like to involve patients more in making decisions about treatment and care	In future I would like to feel my practice was based on fully involving patients in decisions about treatment and care
Tick one box	☐	☐	☐

Example 7

Clinical cultural competency questionnaire[14]

Skills

How **SKILLED** are you in dealing with sociocultural issues in the following areas of patient care?
(circle one number)

	Not at all	A Little	Somewhat	Quite a Bit	Very

1. Greeting patients in a culturally sensitive manner

2. Eliciting the patient's perspective about health and illness (e.g., its etiology, name, treatment, course, prognosis)

3. Eliciting information about use of folk remedies and/or other alternative healing modalities

4. Eliciting information about use of folk healers and/or other alternative practitioners

5. Performing a culturally sensitive physical examination

6. Prescribing/negotiating a culturally sensitive treatment plan

7. Providing culturally sensitive patient education and counseling

8. Providing culturally sensitive clinical preventive services

9. Providing culturally sensitive end of life care

10. Assessing health literacy

11. Working with medical interpreters

12. Dealing with cross-cultural conflicts relating to diagnosis or treatment

13. Dealing with cross-cultural adherence/compliance problems

14. Dealing with cross-cultural ethical conflicts

15. Apologizing for cross-cultural misunderstandings or errors

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[14] Robert C. Like, MD, MS, Center for Healthy Families and Cultural Diversity, Department of Family Medicine, UMDNJ-Robert Wood Johnson Medical School, 2001.

Encounters/Situations

How **COMFORTABLE** do you feel in dealing with the following cross-cultural encounters or situations? (circle one number)

	Not at all	A Little	Somewhat	Quite a Bit	Very

1. Caring for patients from culturally diverse backgrounds

2. Caring for patients with limited English proficiency

3. Caring for a patient who insists on using or seeking folk healers or alternative therapies

4. Identifying beliefs that are not expressed by a patient or caregiver but might interfere with the treatment regimen

5. Being attentive to nonverbal cues or the use of culturally specific gestures that might have different meanings in different cultures

6. Interpreting different cultural expressions of pain, distress, and suffering

7. Advising a patient to change behaviors or practices related to cultural beliefs that impair one's health

8. Speaking in an indirect rather than a direct way to a patient about his/her illness if this is more culturally appropriate

9. Breaking "bad news" to a patient's family first rather than to the patient if this is more culturally appropriate

10. Working with health care professionals from culturally diverse backgrounds

11. Working with a colleague who makes derogatory remarks about patients from a particular ethnic group

12. Treating a patient who makes derogatory comments about your racial or ethnic background