Health Quality Ontario

The provincial advisor on the quality of healthcare in Ontario

November 2015

Excellence Through Evidence: Roadmap for Evidence-Based Recommendations and Quality Standards

Ontario
Health Quality Ontario

About Health Quality Ontario

Health Quality Ontario is the provincial advisor on the quality of health care. We are motivated by a single-minded purpose: **Better health for all Ontarians.**

Who We Are.

We are a scientifically rigorous group with diverse areas of expertise. We strive for complete objectivity, and look at things from a vantage point that allows us to see the forest and the trees. We work in partnership with health care providers and organizations across the system, and engage with patients themselves, to help initiate substantial and sustainable change to the province's complex health system.

What We Do.

We define the meaning of quality as it pertains to health care, and provide strategic advice so all the parts of the system can improve. We also analyze virtually all aspects of Ontario's health care. This includes looking at the overall health of Ontarians, how well different areas of the system are working together, and most importantly, patient experience. We then produce comprehensive, objective reports based on data, facts and the voice of patients, caregivers and those who work each day in the health system. As well, we make recommendations on how to improve care using the best evidence. Finally, we support large scale quality improvements by working with our partners to facilitate ways for health care providers to learn from each other and share innovative approaches.

Why It Matters.

We recognize that, as a system, we have much to be proud of, but also that it often falls short of being the best it can be. Plus certain vulnerable segments of the population are not receiving acceptable levels of attention. Our intent at Health Quality Ontario is to continuously improve the quality of health care in this province regardless of who you are or where you live. We are driven by the desire to make the system better, and by the inarguable fact that better has no limit.

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Executive summary

One of Health Quality Ontario's core functions is to promote health care that is supported by the best available scientific evidence. HQO uses established scientific methods to identify, appraise and interpret the evidence for a wide range of health interventions—including diagnostic tests, devices, procedures and even programs and policies. We work with independent expert committees to make evidence-based recommendations to government, health care organizations and providers in order to inform a variety of decisions, including decisions about which health care services are publicly funded. HQO's analysis and recommendations help health care decision-makers—including government, health care providers and patients—make better decisions. Better health care decisions ultimately lead to better health for Ontarians.

In order to plan and communicate how we will move forward with this part of our mandate, we are putting forward a new plan for our work in the area of evidence-based recommendations. This functional plan supports and aligns with HQO's new strategic plan, which will be released later this year. Some of the key directions outlined in this plan include strengthening and expanding our activities in the area of health technology assessment, launching our new HQO Quality Standards work—concise, actionable and measurable sets of evidence-based recommendations designed to close gaps between current practice and evidence-based care—and developing a new approach for comprehensively evaluating complex health interventions.

Our specific goals over the next three years include the following:

- Publish guides clearly describing the process and methods used for identification, prioritization, development and communication of our health technology assessment recommendations and Quality Standards.
- Initiate collaborative working partnerships with other health technology assessment organizations in order to increase our review capacity and reduce duplication.
- Publish a web-based dashboard that tracks where topics sit in our processes, provides target dates for the completion of active projects and identifies follow-up actions taken on our published recommendations.
- In collaboration with the Ministry of Health and Long-Term Care and other partners, develop and trial a new approach for comprehensively evaluating complex health system interventions.
- Develop a strategy for producing research to fill important gaps in the evidence base related to our recommendations.
- Involve patients and caregivers more closely in providing input throughout all stages of our work.

Across all of our work, we will communicate more broadly with the public and with relevant health care audiences and communities using a variety of communication vehicles. We will involve decision-makers, patients, caregivers and industry more closely in our development processes to maximize the relevance and impact of our work. We will measure the uptake of our recommendations, evaluate our methods and processes and assess our progress against the goals of this plan. And we will seek to make everything we do more open and transparent.

One, two and three year goals

We have set out concrete goals for the next one, two and three years in our work involving evidence-based recommendations and Quality Standards. Details regarding each goal are found within the document.

One-year goals

- Publish a guide describing the methods, process and content elements for HQO's health technology assessment work, including:
  - topic identification and prioritization
  - scoping and study protocol development
  - methods for assessing clinical effectiveness, cost-effectiveness and implications for societal and patient values
  - recommendation formulation
  - processes for involving and communicating with patients, caregivers, decision-makers, industry, health care professionals and the public
- Publish a guide describing the methods, process and content elements for HQO Quality Standards, including:
  - topic identification and prioritization
  - scoping and study protocol development
  - formulation of quality statements and quality indicators
  - processes for involving and communicating with patients, caregivers, decision-makers, health care professionals and the public
  - supporting health system uptake and implementation
- Initiate and realize working collaborations with other health technology assessment agencies
- Publish a tracking system on our website that identifies the topics we have received, their current status and follow-up actions taken on our published recommendations
- Develop new efficient working relationships with our academic partners

Two-year goals

- Publish a methods and process guide for comprehensively evaluating and making recommendations on complex health system interventions
- In collaboration with our partners, develop a strategy for producing research to fill important gaps in the evidence base related to our recommendations

Three-year goals

- Publish a report evaluating the methodological quality of our work, the uptake and impact of our recommendations and our progress against the goals set out in this plan, as well as recommending next steps

Introduction

Evidence shows us what excellent quality health care can look like.

Decisions that are based on the best available scientific evidence result in better health outcomes and a better experience of care. Frequently, decisions based on the best scientific evidence also save money.

These decisions can take many different forms. The Ministry of Health and Long-Term Care may decide to pay for an innovative new medical treatment, a clinician may decide to use a new diagnostic test, or a patient may decide against a treatment offered by his or her physician. The quality of each of these decisions depends on the quality of the available evidence and on how it is incorporated into the decision-making process.

We can point to many examples where decisions supported by scientific evidence have had a positive impact on the quality of health care in this province and improved the health of Ontarians. Deciding where to concentrate stroke services has resulted in people suffering from stroke receiving more effective care, saving lives and preserving people's functional independence (1). Deciding to pay for bariatric surgery for obesity has allowed thousands of Ontarians to improve their health (2). And deciding not to pay for expensive diagnostic tests that science shows to be of very limited value has allowed us to use our limited public resources more effectively (3,4).

Health Quality Ontario's role

Health Quality Ontario (HQO) was established as an agency of the Ontario government by the *Excellent Care for All Act* 2010. Serving as the province's advisor on the quality of health care, HQO's mandate is to monitor and report to Ontarians on their health status and the performance of the health system, to support continuous quality improvement, and to promote health care that is supported by the best available scientific evidence. These functions are closely interconnected and mutually reinforcing. Our organizational priorities for the next 3 years are described in our upcoming HQO strategic plan.

In this document, we outline a detailed functional plan for the part of HQO's mandate related to promoting evidence-based health care. Under the *Excellent Care for All Act,* HQO is mandated to perform two key tasks under this function:

1. making recommendations to health care organizations and other entities on standards of care in the health system, based on or respecting clinical practice guidelines and protocols, and
2. making recommendations, based on evidence and with consideration of the recommendations in subclause (i), to the Minister concerning the Government of Ontario's provision of funding for health care services and medical devices;

HQO's work carries on the tradition of excellence in evidence appraisal, synthesis and support for evidence-informed decision-making previously established within the Ontario Ministry of Health and Long-Term Care, including its role supporting the recommendations of the Ontario Health Technology Advisory Committee (OHTAC).

Why we developed this plan

Moving forward, we believe that a clear, explicit plan is needed to focus, communicate and increase the impact of our evidence-based recommendations and standards of care. Our activities in this area are rapidly evolving. In the coming months, we will be launching a major new line of work—HQO Quality Standards–and we will also be taking substantial steps to increase the transparency of our

methods and processes, improve our communications efforts and more closely involve patients and caregivers in our work. This plan places these activities within an integrated strategic framework that aligns with our new HQO strategic plan and sets out a timeline for their delivery.

This plan has also been developed with careful consideration for the current Ontario health care environment. As all parts of the health system work to manage under growing financial pressures, it is more critical than ever that all health care spending decisions are supported by evidence demonstrating their value. With little new money available, there is added emphasis on identifying areas of low value health spending that could be reallocated to higher value care.

On the other side of this value equation, there has been increased attention on the health technology sector as an engine for innovation and broader economic growth in Ontario. The recent recommendations of the Ontario Health Innovation Council have called for government to work more closely with industry to promote Ontario as a research and innovation hub for health technologies, to promote faster and more consistent uptake of cost-effective technologies and to explore opportunities for earlier developmental evaluations of promising technologies in partnership with industry (5). Above all, the government's commitment to pursuing transformative health care reforms that are strongly rooted in evidence lays down a compelling challenge for HQO to meaningfully support evidence-based decision-making at the highest levels of the health system.

How we developed this plan

Our development of this plan was informed by previous external reviews of the work of OHTAC and HQO's Evidence Development and Standards Branch, recent recommendations issued by OHTAC subcommittees and ideas put forward by staff, senior management, our Board of Directors and members of OHTAC. We also solicited input from a variety of experts, decision makers and relevant interest groups, including colleagues at the Ministry, national and international health technology assessment and guidance development organizations, patient and caregiver representatives, industry representatives and leadership from Ontario health care provider organizations, agencies, associations and academia. We posted a draft version of this plan on our website and solicited public comment in August 2015. This final version of the plan reflects feedback received through each of these stages.

Background

What *evidence* means to HQO

HQO makes recommendations founded on scientific evidence in order to enable better health care decisions. Scientific evidence has been defined as knowledge that is generated through methods that are explicit, systematic, replicable and transparent (6). We use these methods to appraise the evidence supporting health interventions—commonly referred to in this context as *health technologies*—including diagnostic tests, treatments, devices, service models, programs and policies.

We also incorporate other forms of knowledge into our work, including expert opinion, patient, caregiver and public input. While these are sometimes collected using methods that may be viewed as "unscientific", they help us interpret and contextualize the scientific evidence we use.

There is sometimes a misconception that scientific evidence is restricted to quantitative studies or randomized controlled trials. In fact, there are many well-established scientific methods for generating and synthesizing both qualitative and quantitative evidence using both experimental and non-experimental designs in order to answer a wide range of research questions.

At HQO, we draw from a variety of qualitative and quantitative sources to answer questions such as the following:

- How safe and effective is a new intervention or diagnostic test under ideal conditions?
- How safe and effective is a new intervention likely to be in real world Ontario health care settings?
- What are the relative costs and benefits of a new or existing treatment or test, relative to other potential treatments or tests?
- How should societal and ethical implications be considered?
- What are the potential implications for equity?
- How should we incorporate public, patient and caregiver perspectives into decision-making?
- How can evidence-based interventions be implemented in Ontario?

Incorporating and integrating this diversity of knowledge into our work requires interdisciplinary skills and capability. Our staff and external collaborators bring expertise in a wide range of fields, including clinical epidemiology, health economics, health services research and qualitative synthesis.

The use of scientific evidence is woven into all of HQO's work. Our quality improvement experts work with health care providers to build capacity in the use of statistical process control techniques in order to monitor the effects of interventions over time. These skills allow health care professionals to use explicit, systematic, replicable and transparent methods to generate the local evidence they need to understand whether newly implemented changes are resulting in improvement (7). Our measurement and reporting initiatives use statistical techniques to determine whether differences in performance – either over time or between regions or health care providers – are meaningful (8).

At HQO, we apply all of these mutually reinforcing functions and methods in an integrated approach to help health care decision-makers "do the right things right" – to know not only what interventions evidence shows to work, but also how to implement them effectively and evaluate the results (9). Our goal is to support a continuously learning Ontario health system, where evidence informs every health care decision made by patients, the public and health care professionals.

Figuring out if it works: evidence-based medicine

While HQO's use of scientific evidence to understand the effects of health care interventions is far from a new concept, the approach of systematically using evidence to inform health care decision-

making is more recent than many assume. The term “evidence-based medicine” was coined less than a quarter century ago – by Gordon Guyatt from McMaster University (10) – to describe a “a new paradigm in medical practice which de-emphasizes intuition, unsystematic clinical experience and pathophysiologic rationale as sufficient grounds for clinical decision-making, and stresses the examination of evidence from clinical research” (11). A key milestone in the evidence-based medicine movement was the development of the GRADE (Grading of Recommendations Assessment, Development and Evaluation) (12) methodology for appraising the quality of research evidence. HQO uses the GRADE methodology in examining the effectiveness of health interventions.

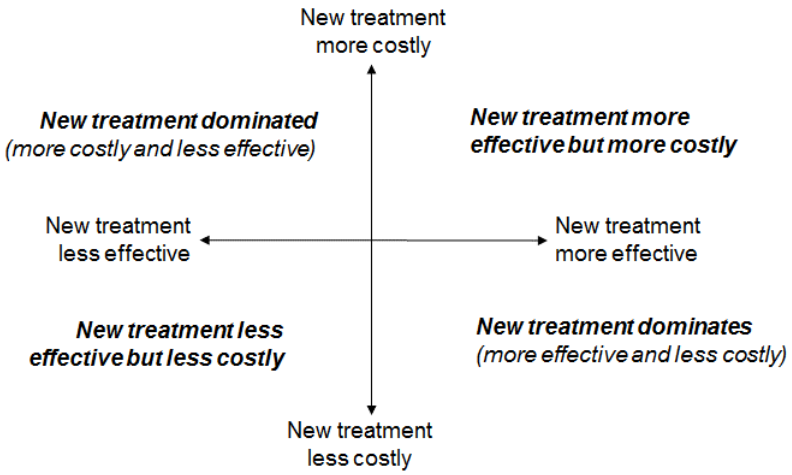
The global paradigm shift toward evidence-based medicine has led to thousands of new clinical trials being reported each year, rapid growth in systematic reviews synthesizing evidence from these trials as well as expanding efforts to produce evidence-based clinical practice guidelines (13).

Figuring out if it’s worth it: health technology assessment

Evidence-based medicine focuses mainly on the use of evidence to inform clinical decision-making. Health technology assessment extends these methods into health care policy decision-making, combining the use of evidence-based medicine’s methods for determining the clinical effectiveness of interventions with methods for examining their cost-effectiveness, organizational impacts and implications for societal and patient values in order to answer questions about their value for money and the impact of their implementation. In order to assess and compare the impacts of different types of interventions on patient outcomes, HQO and many other health technology assessment organizations use the *quality-adjusted life year* (QALY), a standardized measure of health which takes into account both the quantity and quality of life lived (14).

A key concept in health technology assessment is the *incremental cost-effectiveness ratio* (ICER), which assesses the difference in both costs and benefits of a new intervention as compared with an existing intervention (15). Figure 1 plots the ICER along a plane (called the cost-effectiveness plane), with the incremental cost of an intervention measured along the vertical axis and its incremental effectiveness (typically measured in QALYs) along the horizontal axis (16). Many new treatments and diagnostic tests are more effective but also more expensive, and as such require societies and individuals to make difficult decisions.

Figure 1: Example cost-effectiveness plane used in health technology assessment



HQO and health technology assessment in Ontario

In Canada, the first health technology assessment agency was established in Quebec in 1988. The Canadian Coordinating Office for Health Technology Assessment was established in 1989 and later became the Canadian Agency for Drugs and Technologies in Health (17). In 2003 the Ontario Health

Technology Advisory Committee (OHTAC) was created to serve as a provincial advisory body (18). OHTAC was moved to HQO after its establishment, and continues to make recommendations about new tests and treatments, consistent with HQO's mandate under the *Excellent Care for All Act*.

HQO is part of a rich Canadian network of health technology assessment organizations. The Canadian Agency for Drugs and Technologies in Health evaluates a wide range of health technologies from a national perspective, and maintains the Common Drug Review and pan-Canadian Oncology Drug Review programs, both of which support decisions made by the Ontario Ministry of Health and Long-Term Care. HQO also has provincial health technology assessment counterparts in several provinces (e.g., *l'Institut national d'excellence en santé et en services sociaux* in Quebec and the Institute of Health Economics in Alberta), as well as a variety of other health technology assessment organizations based in academic centres and hospitals.

Our plan

The following sections outline our roadmap for developing and supporting the adoption of evidence-based recommendations and standards for improving health care in Ontario.

Key principles that guide our work

Our work developing evidence-based recommendations and standards is guided by a set of key principles that reflect the broader values of HQO as an organization:

- **Transparency:** We are committed to an open approach for all things we do. We intend to publish information about all of our work, including how project topics are identified and selected (or rejected), how we perform our analyses, how recommendations are formulated and how we consider input from patients, caregivers, experts and the public.

- **Excellence:** We apply leading scientific methods in our work and are continuously innovating. We ensure a consistently rigorous standard of quality in all our work through internal and external peer review.

- **Engagement:** We will meaningfully involve patients, caregivers, the public and health care decision-makers in all the work that we do. We build and nurture productive working partnerships with industry, academia, clinical associations and other health care organizations involved in evidence- and quality improvement-related work.

- **Efficiency:** As a publicly funded agency, we are committed to wisely using the funds we are entrusted with to maximize the impact we have on improving Ontario health care. We constantly strive to streamline and find efficiencies in the work we do and minimize duplication with the work done by other organizations.

- **Relevance and impact:** We measure the ultimate success of our recommendations and analyses by their impact on improving the health of Ontarians. We work closely with health care decision-makers—including purchasers, providers, patients and caregivers—and customize our products to meet their specific needs in a timely and responsive way. We proactively communicate our recommendations and analysis to the public and to relevant health care communities to ensure that they have maximum impact on health care in Ontario.

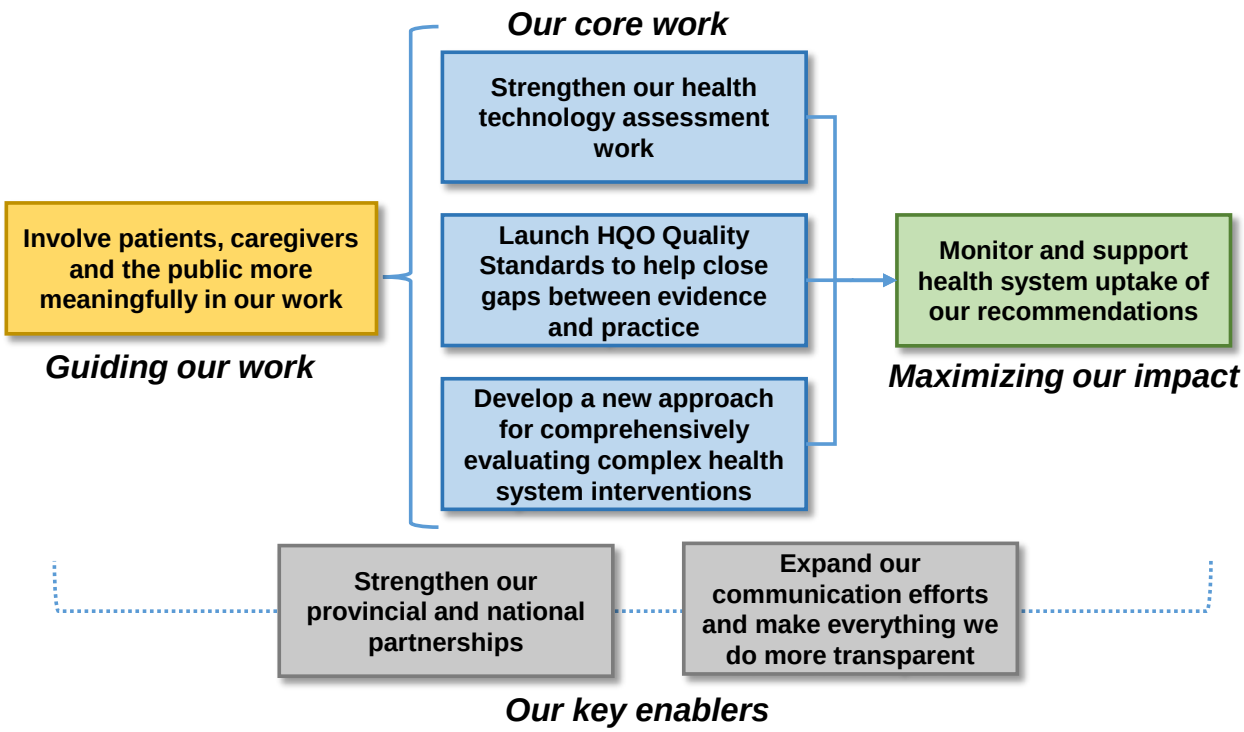
Our strategic objectives

We have set out the following seven strategic objectives to frame the key directions in our plan:

1. Strengthen our health technology assessment work
2. Launch HQO Quality Standards to help providers close the gap between evidence and practice in important areas
3. Develop a new approach for comprehensively evaluating complex health system interventions
4. Monitor and support health system uptake of our recommendations
5. Involve patients, caregivers and the public more meaningfully in our work
6. Strengthen our provincial and national partnerships
7. Expand our communication efforts and make everything we do more transparent

These objectives are interconnected and mutually reinforcing. Figure 2 illustrates their relationships.

Figure 2: Connecting our 7 strategic objectives



Strategic objective 1: Strengthen our health technology assessment work

Two of HQO's key strategic priorities are to provide information to enable better health system decision-making and to evaluate promising innovations and practices, supporting broad uptake of those that provide good value for money. HQO's health technology assessment work supports these objectives by informing the decision-making needs of those who pay for health care in Ontario, especially the Ministry of Health and Long-Term Care. Our health technology assessments consider the clinical effectiveness and cost-effectiveness of health technologies, including medical devices, procedures, diagnostics and a variety of other interventions, in order to inform decisions about whether these interventions improve health and represent good value for money. HQO also considers issues around the implications of health technology decisions for societal and patient values, as well as health system and organizational considerations related to the implementation, expansion or removal of technologies.

Expanding our efforts to identify high impact topics

The health care landscape is changing rapidly, with new technologies (e.g., genomic testing) and new forms of care (e.g., remotely delivered "virtual" care) rapidly emerging. Health Canada approves thousands of new medical devices each year, and many hundreds of emerging health technologies do not even require Health Canada licensing. While some of these technologies are potentially revolutionary, others are follow-on products or refinements to existing interventions. HQO has been entrusted with the mandate to make recommendations on a broad range of health care services and technologies (excluding prescription medications, which are evaluated by the Ministry of Health and Long-Term Care). Given this huge range of new and existing technologies for evaluation and the limited resources we have available, we must identify and prioritize topics that are of high potential impact.

HQO will identify new candidate topics for health technology assessment through two major approaches:

- **External applications:** We accept submissions for technology assessments from any applicant through completion and submission of a standardized information form on our website (available here: http://www.hqontario.ca/evidence/ohtac-application-process).

- **Scanning and identifying high impact topics:** We will also proactively identify high impact candidate topics by gathering information from clinicians, health care providers, industry associations and provincial agencies—as well as by reviewing databases such as those maintained by Health Canada and our Canadian health technology assessment partners, the US Agency for Healthcare Research and the UK National Institute for Health Research.

In the coming years, we will expand our outreach efforts to seek high impact topics from all parts of the health system, with increased emphasis on soliciting ideas from health care decision-makers beyond our traditional Ministry and hospital applicants, including primary care practices, mental health organizations, long-term care homes, home and community care agencies, Local Health Integration Networks, Health Links and patient, caregiver and professional associations.

Refreshing our criteria for prioritizing new topics

Once identified, candidate health technology assessment topics will be prioritized for assessment using an evidence-driven multidimensional set of criteria that asks questions such as the following:

- What are the potential impacts of the intervention on patient outcomes and safety? What is the magnitude of potential overall benefit or harm?
- What are the potential impacts of the intervention on government spending?
- Are there time pressures on decision-makers (e.g., government or provider organizations) to make a decision around the intervention?
- Is there sufficient evidence available at this time for a review to be feasible? Is additional evidence expected to come to light in the near future?
- What are the societal and ethical considerations around an intervention? If the intervention applies only to a small population (i.e. small aggregate benefit), could it have a potentially life-changing impact on this group?
- Are there other health technology assessment agencies currently undertaking a review of the topic? Are there opportunities to collaborate or reduce duplication?

In the next 12 months, HQO will publish a guidance document describing in further detail our process and criteria for identifying, selecting and prioritizing topics for health technology assessment.

Evolving and publishing our methods and processes

The methodological quality of health technology assessment work in Ontario has been internationally recognized. At HQO, we continue to work with research partners and experts in the field to expand and refine our health technology assessment methods to ensure that we have a world-class methodological toolbox to appropriately address a wide variety of questions that are relevant to decision-makers. We will continue to seek opportunities for our staff to attend and present HQO's work at leading scientific conferences, where they can keep abreast of global methodological developments and incorporate these advances into our own work.

At HQO, we also recognize that it is good practice to ensure that its methods and processes for health technology assessment are publicly available and transparent. In the next 12 months, we will publish a guidebook detailing our overall health technology assessment methods and processes. Where possible, we will collaborate with other peer health technology assessment organizations—such as the Canadian Agency for Drugs and Technologies in Health—to harmonize our methods.

Leveraging a wider spectrum of knowledge to inform decision-makers

In contrast with many prescription drugs, the interventions we evaluate are rarely standalone technologies: their costs and effectiveness are intricately linked with how they are used within organizations, programs and disease pathways. Their effects can be influenced by the skill and familiarity of users, as new devices and procedures often involve a learning curve where effectiveness increases over time (19). The non-drug health technology market is also more heterogeneous and dynamic than the pharmaceutical market in several key respects: within a typical "class" of health technology evaluated in one of our health technology assessments, there may be a number of different products and brands that have material differences in their properties and price tags; prices often decrease over the lifecycle of a technology, changing its cost-effectiveness profile, and; non-drug technologies typically have shorter lifespans than drugs, quickly moving from first to second generation and potentially requiring reassessment as a result (20).

For reasons such as these, while traditional health technology assessment methods anchored on systematic reviews, meta-analyses and economic analysis will always be core components of HQO's approach, we will increasingly incorporate a wider range of evidence sources into our reviews to provide end users with a broader spectrum of information relevant to decision-making. Rather than a rigid hierarchy of evidence, the optimal approach for informing decision-making over some interventions can involve triangulating a mix of different types of evidence in order to counterbalance their individual strengths and weaknesses and draw a more comprehensive picture of the properties of an intervention (21).

We will work with end users to incorporate other types of information into our health technology assessments that are needed for their decision-making. Purchasers in hospitals and procurement organizations have called for information to help them better understand the human resource and organizational impacts, learning curves and range of products available in a given class of health technology. Leveraging Ontario's rich administrative and clinical datasets, we will incorporate innovative new approaches for economic analysis and modeling implementation scenarios. Where relevant, we will conduct more detailed investigation into the experiences of other jurisdictions in implementing major interventions in order to inform implementation considerations for Ontario. We will also work to more consistently incorporate input from patients and caregivers as an important source of knowledge in our work.

Incorporating societal and patient values analysis

Informed by the recent in-depth analysis and recommendations of OHTAC's Public and Patient Engagement Subcommittee and OHTAC's Decision Determinants Subcommittee, HQO will be implementing a more consistent approach toward developing and integrating societal and patient values analyses into our health technology assessment work.

Renewing our decision framework for health technology assessment recommendations

OHTAC has long been respected for the expertise of its members, the soundness of its judgments and its ability to develop recommendations that are well suited to policy adoption. OHTAC's decisions have been guided by a rigorously developed framework that considers the evidence for a health intervention in four key areas: clinical benefits and harms, value for money, consistency with expected societal and ethical values and feasibility of adoption into the health system (22). OHTAC's recommendations have a strong track record of meaningful health system impact; we will further strengthen OHTAC's ability to make impactful recommendations by publishing an updated decision framework and set of criteria that build on the recommendations of the OHTAC Decision Determinants Subcommittee. Through this framework, we will provide more consistent guidelines for the levels of evidence required to support different types of OHTAC decisions. We will also articulate clear guidelines for how OHTAC recommendations should be formulated and expressed.

Strengthening our efforts to promote more appropriate care and identify obsolete or low-value technologies

While HQO has a key role in evaluating new or emerging health technologies to ensure that decision-makers are appropriately informed about their implications for practice in Ontario, the implications of HQO's health technology assessments are not limited to new technologies. In some cases, a new health intervention that HQO determines to be cost-effective may be superior to an existing intervention. In other cases, a health technology assessment may determine that an existing intervention may not be clinically effective, sufficiently safe or represent good value for money. HQO has made several recommendations in this vein in recent years, leading to existing health care spending being reallocated to fund higher value care (4). In addition, HQO provides evidentiary support to its partner Choosing Wisely Canada for their work with physician professional groups to identify current practices that may be ineffective or wasteful (23).

Strategic objective 2: Launch HQO Quality Standards to help providers close the gap between evidence and practice in important areas

Our new HQO Quality Standards program is a keystone of our plan.

Quality Standards are concise sets of evidence-based recommendations that focus on high priority opportunity areas for improvement in a clinically-defined population (e.g. adults with schizophrenia), service area (e.g. pre-operative testing) or health system issue (e.g. patient-provider communications). They support HQO's strategic priority of providing system-level leadership for health care quality in key areas where there are identified gaps between current practice and optimal care.

Each Quality Standard will contain between 5 and 15 quality statements, or recommendations for high quality care. Each quality statement will be accompanied by quality measures that can be used for quality improvement and/or public reporting. And each Quality Standard will be developed with a clear plan for supporting its health system uptake and implementation.

In this sense, Quality Standards are considerably broader than our health technology assessment recommendations, but less comprehensive than traditional clinical practice guidelines. Quality Standards focus on a small set of high impact strong recommendations, whereas clinical guidelines often include conditional or equivocal recommendations.

While Quality Standards are new for Ontario, NICE first established a similar program for England in 2009 and we have learned from their experience (24). We will also draw from the expertise we have built developing "mega-analyses" (multiple HTA assessments around a single disease or health state) as well as Clinical Handbooks for Quality-Based Procedures. In contrast with Clinical Handbooks and mega-analyses, Quality Standards will be directed primarily toward clinicians and provider organizations, and produced and disseminated in formats that are accessible to these audiences—supporting HQO's strategic priority of increasing the availability of information to enable better decisions.

In the 12 months following the release of this report, we will release a guide describing our detailed methods and processes for identifying, developing and implementing Quality Standards. Our first three Quality Standards will focus on mental health-related topics: schizophrenia, major depression and dementia with agitation or aggression.

Identifying and prioritizing new topics for Quality Standards

We will prioritize the development of Quality Standards in areas where there is evidence for the potential to make significant improvements in the quality of care in Ontario. Selection of candidate topics will be informed by consistently applied criteria, including the following:

- The aggregate burden of disease and overall system cost impact of a population or service area

- The existence of evidence demonstrating substantial regional or institutional variations in practice and outcomes for a patient population or service area
- The availability of evidence to support the definition of best practice care in an area
- The potential for overall improved outcomes or reduced cost in an area through more consistent adoption of best practice
- Consistency of the topic area with HQO's mandate and strategic priorities—for example, enhancing quality when patients transition between different providers or care settings
- Alignment of the topic with the mandates of other provincial organizations—for example, is there another provincial agency already tasked with settings standards in this area?
- The availability of support from other Ontario and national organizations to collaborate in supporting the development and implementation of the Quality Standard, including provincial disease organizations, patient, caregiver and professional associations
- The potential alignment of the topic with other HQO activities, such as theme reports and quality improvement plans

Engaging partners in scoping new Quality Standards

Defining the scope of each Quality Standard is critical. While the focus of a Quality Standard is broader than a single technology assessment, its parameters need to be defined so as to enable a reasonably concise list of recommendations to be developed.

HQO will develop the scope of each new Quality Standard in close consultation with patients, caregivers, health care professionals and organizations that have an interest in the topic. Similar to our health technology assessments, a protocol plan will be developed and circulated in draft to relevant organizations and individuals for comment.

Partnering with professional bodies and associations

A crucial condition for every Quality Standard is our ability to develop and implement the Quality Standard in partnership with organizations and associations that have a stake in improving care in the topic area. We will work with external experts to develop recommendations and advise on challenges and opportunities for their Ontario health system adoption. We will involve partner organizations in developing and supporting implementation of each Quality Standard. We recognize that while we bring methodological expertise to the table, our partners bring crucial system perspectives on how care is provided in each topic area and how care can be improved.

Developing performance measures for quality statements

Each quality statement within a Quality Standard will be accompanied by associated performance measures falling into three categories (25):

- **Structural measures:** are the right components and infrastructure in place to deliver on the quality statement?
- **Process measures**: what percentage of eligible patients are receiving the recommended practice?
- **Outcome measures**: are we seeing the expected impacts of the recommended practice on patient outcomes like mortality, functional status and patient experience?

Depending on their content, some quality statements may only be accompanied by one of these types of measures while others will be accompanied by all three types of measures.

The measures we develop for Quality Standards will draw on the broad and deep expertise we have built through HQO's many performance measurement and reporting initiatives, including our public reporting efforts, personalized practice reports, the development of indicators for Quality-Based Procedures, and our current program of work developing a framework for structural measures. Where

provincial data sources exist for reporting Quality Standard measures, we will provide technical definitions for the measure. While we anticipate that many of the recommended measures will be either only feasible or most appropriate for local data collection, reporting and quality improvement efforts, we will also begin to provincially report high impact measures where data is available through existing reporting vehicles such as *Measuring Up*, theme reports and personalized practice reports.

In order to drive improvement, it is important for health care organizations and clinicians to not only measure their performance, but to compare and benchmark this against their peers and set ambitious but achievable targets for improvement. For Quality Standard measures that we provincially report, will seek to provide health care organizations with comparative data on the performance of similar Ontario organizations. We will also work to develop provincial benchmarks for selected Quality Standard measures where it is believed that these will accelerate improvement, using our established HQO benchmarking process (8).

Supporting uptake and implementation of Quality Standards

At HQO, we recognize that our Quality Standards will have little value if they simply sit on a website, unused. We will therefore develop each Quality Standard with a view toward supporting its uptake across the Ontario health system. We will employ a variety of communication vehicles to broadly disseminate each Quality Standard among health care professionals, patients, caregivers and the public. We will fully leverage the implementation mechanisms that HQO has at its disposal, including quality improvement plans, the Adopting Research to Improve Care (ARTIC) program, communities of practice and our suite of performance reporting vehicles. And we will work with our partners to support uptake of Quality Standards and, where appropriate, align health system levers such as funding policies, clinical order sets and accountability agreements. These activities to support uptake and adoption will be clearly set out in an implementation plan for each Quality Standard that we develop in collaboration with our partners.

Integrating health technology assessment into Quality Standards

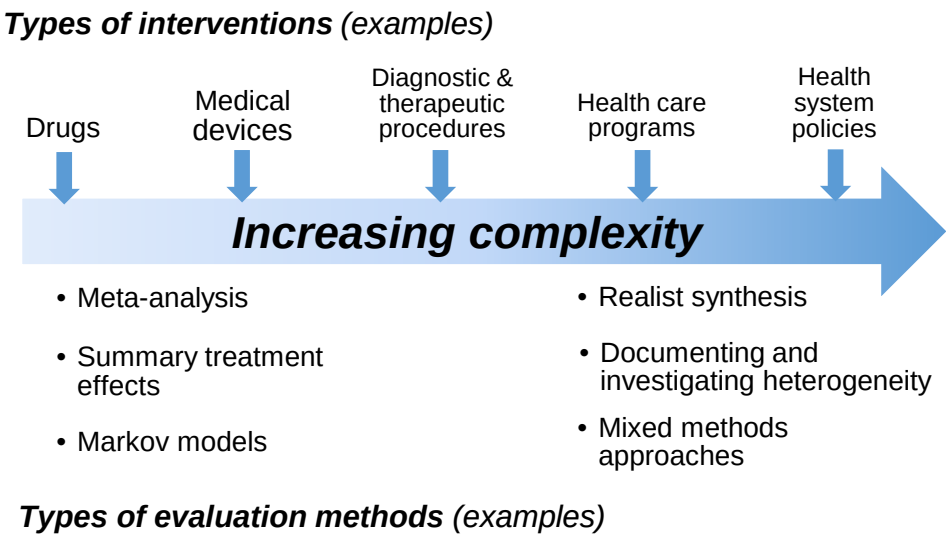
Over time, Quality Standards will also provide a vehicle to integrate our health technology assessment recommendations into the care pathways of relevant Quality Standard populations or service areas. Recent attention has focused on the need to consider new and existing technologies not as single "one-offs" but within a more meaningful context of clinical pathways for patient populations (26). Quality Standards provide an evidence-based guidance platform to integrate new clinically and cost-effective interventions (or de-commission obsolete or low value interventions) within Ontario-wide care pathways.

Strategic objective 3: Develop a new approach for comprehensively evaluating complex health system interventions

As the provincial advisor on health care quality, HQO is asked to examine and provide recommendations on increasingly more complex quality-related health system and policy issues. For example, we have recently been asked to provide advice on a provincial diagnostic imaging quality assurance program as well as a provincial quality oversight framework for services provided in out-of-hospital clinics. We have also provided advice on the design of frameworks for evaluating the impacts of health system funding reforms on quality of care.

The challenge of evaluating complex interventions is not a new one to HQO. Our mandate involves conducting health technology assessments for interventions that typically involve complex considerations for decision makers (illustrated in Figure 3). In recent years, we have moved even further along this complexity spectrum, undertaking multiple technology reviews of delivery strategies and models of care such as the Optimizing Chronic Disease Management and End of Life Care reviews.

Figure 3: A spectrum of complexity across interventions and evaluation methods



These past reviews have also highlighted some of the restrictions of the traditional PICO framework (Population, Intervention, Comparison, Outcome(s)) to structure research questions, and the limitations of traditional evaluation methods such as meta-analyzing summary estimates of effects, to assess some of these more complex interventions. While the information generated by these classic methods is always important, this relatively narrow evaluation approach often does not provide decision-makers with the full range of knowledge they require to make informed decisions around multi-component health care programs, policies and models of care, where it is often crucial to know not only whether an intervention "works" or not but also why and how it works, and under what sorts of conditions. Evaluating these more complex interventions may also require disentangling the effects of interacting components, contexts and feedback loops, including dependencies on human behaviours (27).

Developing a new evaluation approach for complex health system interventions: comprehensive and collaborative

Evaluating complex health system interventions is a decidedly more challenging and resource-intensive task than traditional health technology assessment for drugs and devices. However, we believe that it is of the utmost importance to provide decision-makers with comprehensive, scientifically generated knowledge to address questions around system-level interventions such as new policies and delivery model reforms that may have far-reaching impacts on Ontarians.

While this field of evaluation is a relatively new one on the global stage, leading technology assessment agencies in other jurisdictions such as the United States Agency for Healthcare Research and Quality have similarly acknowledged the need to explore different methods and processes for evaluating complex interventions than those used for traditional technology assessments (28). There is a rapidly emerging international body of methods for conducting systematic reviews of complex interventions (28,29), including mixed methods techniques, a range of qualitative synthesis methods (30) and approaches for identifying and codifying levels of heterogeneity (31). In order to expand our capacity to meaningfully address these complex health system issues, we will begin to develop options for integrating these new approaches into our existing methodological toolkits and review processes.

We recognize that this work cannot simply be methodologically innovative; it must be purpose-built for providing meaningful, actionable information to health system decision-makers. This may require adopting significantly different processes and working relationships with decision-makers for these

new evaluations than those used in conventional health technology assessment. Where traditional evidence reviews are generally carried out using a detached, ex-post summative evaluation approach, conducting meaningful, impactful evaluations of complex health system and policy interventions often requires doing so in close collaboration with decision-makers using a developmental evaluation approach. In this way, the evaluation findings can be used to inform the design and deployment of policies on an ongoing, "real time" basis (32).

To this end, over the next 2 years we will partner with the Ontario Ministry of Health and Long-Term Care, the Institute for Clinical Evaluative Sciences and other key provincial decision makers to collaboratively produce a white paper describing a new framework for analyzing and producing recommendations on complex health system interventions. The paper will outline potential methods to support this work as well as a new collaborative evaluation process where HQO will work closely with decision-makers to ensure that our work is closely aligned with their needs and ultimately produces actionable information with real system impact.

Strategic objective 4: Monitor and support health system uptake of our recommendations

Our vision is better health, supported by excellent care for all Ontarians. To help realize this vision, we will support health care professionals in adopting evidence-based recommendations. To achieve this, we will work closely with health care providers, government, Local Health Integration Networks and provincial agencies and associations to assist in the implementation of our recommendations.

Expanding our post-recommendation monitoring and reporting

HQO has been using administrative data to track post-recommendation utilization of selected health interventions for several years (33). We will build on the success of these efforts by continuing to monitor and report on an expanding range of new OHTAC recommendations, as well as introducing similar reporting for HQO Quality Standards.

Because our post-recommendation monitoring is largely dependent on provincial administrative datasets, we will work with the Canadian Institute for Health Information and the Ministry of Health and Long-Term Care to advocate for amendments to coding definitions to enable meaningful reporting of recommendations where current data elements do not enable accurate monitoring. We will also work with national and provincial partners to explore the use of disease registries for monitoring such as those available for cancer, cardiac and stroke services. In the future, evolving information infrastructure such as the adoption of Universal Device Identification and expansion in the use and functionality of electronic health records may present exciting opportunities to expand our reporting capacities.

In addition to highlighting regional variations and trends in practice over time, HQO's post-recommendation monitoring supports a 'lifecycle' approach towards the evaluation and management of health technologies. The use of many health technologies evolves significantly over time as technologies diffuse to new indications and patient subgroups beyond their original intended population, changes occur in models of care (for example, shifts from inpatient to outpatient care) and there are refinements to the technology itself and its cost structure. Long-term monitoring of technologies enables us to gather real world evidence around the intervention's use in Ontario following an OHTAC recommendation, including potential safety events that may occur too rarely to be adequately captured in clinical trials.

Based on post-recommendation monitoring data, we may decide to trigger a reassessment of a technology for reasons such as evaluating the clinical and cost-effectiveness of its use in a broader patient population or set of indications, or its relative effectiveness in light of other newly introduced interventions which may render it obsolete or replaced by a subsequent generation technology. This reassessment may then in turn inform new policy or funding decisions by the Ministry of Health and Long-Term Care, hospitals and other decision-makers.

Building health system capacity to 'do the right things right': supporting and learning from implementation efforts

HQO is relatively unique among international evidence-based guidance development organizations in that we also actively support a wide range of "on the ground" implementation and quality improvement efforts across Ontario. These include HQO-managed programs such as the Adopting Research to Improve Care (ARTIC) knowledge translation platform, the Improving & Driving Excellence Across Sectors (IDEAS) program's efforts to build quality improvement capacity, and our work supporting Ontario's Health Links strategy. These HQO programs, in combination with our partner organizations such as the MaRS EXCITE program, allow us to connect our recommendations on "what works" with mechanisms to implement them in the Ontario health system and understand "how they work" in different real world settings.

HQO's close connection with on-the-ground implementation efforts also gives us the unique ability to draw knowledge from these efforts to create a "feedback loop" back into our evidence synthesis and recommendation development work. In order to enable health care professionals to leverage this knowledge, we will begin to seek out and publish Ontario case studies describing local initiatives to implement our evidence-based recommendations, including their challenges, innovative approaches and the impacts of these initiatives on outcomes over time.

Working with our growing network of research partners, we are also supporting projects to create a virtual "real world improvement laboratory" that will generate new knowledge to understand how interventions with strong evidence support can be optimally implemented in the Ontario health system and the effectiveness of these interventions under different real world contexts (34).

Supporting evidence-driven and value-based reimbursement design

HQO is legislated under the *Excellent Care for All Act* to advise on funding for health technologies. As such, health care provider reimbursement mechanisms have long been one of the major health system levers for driving adoption of our evidence-based recommendations. OHTAC decisions have frequently resulted in changes to physician fee schedule codes such as the addition or deletion of reimbursed services, or changes in conditions eligible for reimbursement, based on evidence such as the effectiveness of a test or procedure in different patient subgroups (4).

In recent years, Ontario has undertaken major reforms in the way it pays for health care: most primary care physicians have now shifted to capitated payment models while hospital and long-term care providers are now increasingly paid based on their volumes and complexity of care. These new funding platforms present potential opportunities to more closely align payment with evidence. For example, some experts have suggested incorporating 'value-based modifiers' into payments based on the relative value of services according to health technology assessment (35). Ontario can learn from other jurisdictions that have instituted processes for linking health technology assessment decisions with payment model changes, updating the prices of services to reflect the costs of clinically effective and cost-effective new technologies (36). We will work with the Ministry of Health and Long-Term Care and other provincial partners to explore options for more tightly linking evidence-based recommendations and funding models.

Strategic objective 5: Involve patients, caregivers and the public more meaningfully in our work

At HQO, one of our core principles is to engage patients and caregivers in all the work we do, adopting a *"No decision about me, without me"* principle (37). This approach is particularly crucial in our evidence-based recommendation development, where the complex and technical nature of the methodologies used to develop this work can easily obscure or crowd out the perspectives of patients and caregivers. Ultimately, the objective of our recommendations is to improve patient care in Ontario; in order to ensure this objective is achieved, we need to meaningfully involve the input of patients and caregivers in the development of our recommendations.

We will involve patients and caregivers in each health technology assessment and Quality Standard that we produce by explicitly incorporating the input of patients and caregivers into scoping the analysis, including seeking their input around meaningful outcomes, interventions and contextual factors. We will also involve patients and caregivers in reviewing our methods and approaches toward health technology assessment and the development of Quality Standards.

Each Quality Standard that HQO develops will be accompanied by a patient-focused summary version that outlines in plain language what high quality care patients should expect to receive in the topic area. We will also explore options for producing patient-focused tools and resources such as patient decision aids for conditions and procedures where evidence shows that patient treatment preferences differ and are shown to influence the types of care sought when patients are fully informed. Studies have shown that patient decision aids can improve patient outcomes, experience of care while tending to reduce unnecessary health care costs overall (38,39).

While evidence-based medicine and health technology assessment can inherently be very technical subjects that make for difficult public consumption, we have long been committed to engaging the public in our work. We publish every draft recommendation for a 21-day public comment period on our HQO website, and give full consideration to each of these comments, which frequently lead to changes in recommendations. Each of our new Quality Standards will also be published for public comment using a similar approach. Over the next year, we will also begin to explore options for enhancing our communications approach around these public comment opportunities to ensure they reach all relevant audiences.

Strategic objective 6: Strengthen our provincial and national partnerships

Building working collaborations with other Canadian health technology assessment agencies

"Globalize the evidence, localize the decision" (40) is an increasingly widely accepted philosophy in international health technology assessment. Recent studies have pointed to the amount of duplication that routinely occurs in the health technology assessment world, with multiple agencies often independently undertaking very similar reviews of the same topics. This duplication of efforts results in waste and cost inefficiency, and means that individual agencies do not fully maximize their limited resources. In recent years, a number of European health technology assessment organizations have initiated collaborative arrangements to reduce duplication of efforts and increase overall capacity (41).

Consistent with this international movement, HQO will work over the next 12 months with its Canadian health technology assessment counterparts—including the Canadian Agency for Drugs and Technologies in Health, Alberta's Institute for Health Economics in and Quebec's National Institute for Excellence in Health and Social Services—to formalize collaborative working relationships around health technology assessment production and explore alignment of methods and processes.

This collaborative approach will see that 'global' health technology assessment evidence components (such as systematic reviews of the evidence for the efficacy of particular technologies) are developed pan-nationally in the most efficient way possible, while provincial efforts are focused on value-added context-specific analysis. As a member of the International Network of Agencies for Health Technology Assessment, HQO is also well-positioned to learn from international best practices in developing a collaborative, partnership-driven approach to this work.

Working more closely with industry

We recognize the important role of the health technology industry as innovators and producers of health interventions evaluated by HQO. Often, industry also plays a key role in both evidence development and health system implementation of these technologies. Input from industry can provide us with valuable insights into issues related to the effectiveness, resource impacts, usability and adoption of technologies. Close consultation with industry experts and our health technology partners such as MaRS EXCITE will be particularly important in exploring options for earlier health technology

assessment in Ontario, and determining at what point in the lifecycle of a new technology an evaluation can meaningfully be developed, given the available evidence.

In addition to consistently involving industry in our new scoping process for health technology assessment, in the coming months following the release of this report, we will work with industry partners to establish a process for regular meetings between HQO, representatives from the health technologies sector and other relevant decision maker groups such as the Ministry of Health and Long-Term Care, hospital and physician associations. These meetings will enable us to proactively discuss and address system- and industry-wide issues and trends that go beyond the scope of individual technologies under assessment.

We will also strive to ensure that our methods and criteria for evaluation are more accessible to industry. In addition to publishing guides describing our health technology assessment and Quality Standards methods and processes, we will host meetings with industry following the release of this plan to discuss both the technical and strategic aspects of our approach in further detail.

Working with research partners to fill important gaps in the evidence

While the bulk of our work focuses on the appraisal and synthesis of existing evidence, we also have a history of commissioning primary research through our network of research partners (42). Where OHTAC reviews a technology and finds that it holds promise but also presents substantial residual uncertainty as to its clinical or cost-effectiveness in the Ontario health system, HQO can commission research to fill in “gaps” in the evidence necessary to make a recommendation. Going forward, we will typically do this in partnership with entities that fund health services research in an open and transparent manner. Leveraging Ontario’s rich assets in health services research and methodology development, we will also continue to commission targeted studies to support the development of innovative methods for developing our analyses.

We will strengthen our partnerships with other research funding organizations such as the Canadian Institutes for Health Research and the Ministry of Health and Long-Term Care to increase the likelihood that there is research sector uptake when we issue a recommendation for further research. We will also explore opportunities for collaborative research projects, and new research projects around developing and testing innovative evaluation methodologies and mechanisms for implementation, including new approaches for post-recommendation monitoring and analysis.

Strategic objective 7: Expand our communication efforts and make everything we do more transparent

A shared commitment to transparency and integrity in all the work we do is a key organization-wide value held by HQO. It is particularly important to reflect this value in the work we do developing, publishing and supporting evidence-based recommendations and Quality Standards, where recommendations may have substantial consequences for Ontario patients, caregivers and health care professionals in terms of changes in clinical practice and the funding of health care interventions.

We recognize that it is good practice to ensure that the methods and processes we use in our work—including how we select new topics for this work—are publicly available, transparent and accessible. To this end, over the next 12 months, we will publish documents detailing the key elements of our methods and processes for both health technology assessment and Quality Standards, including the following: our topic identification and prioritization process and criteria; the methods we use in our analyses; our processes for involving patients, caregivers, decision-makers, industry, health care professionals and the public, and; our frameworks for wording health technology assessment recommendations and quality statements.

As we establish our new approach for evaluating complex interventions, we will publish a similar methods and process guide for this work in the next 2 years.

Launching a web-based dashboard for tracking topics through our processes

We are committed to improving the transparency and visibility of our work by publishing timely information on the topics we select and where they are in our process. In the next 12 months, we will launch a dashboard tracking system on the HQO website which will allow the public to keep informed about our current work in health technology assessment and HQO Quality Standards. In particular, the dashboard will identify health technology assessment topics that we have received and where they are across the key stages of our process: prioritization (or rejection, with rationale), scoping, analysis development, pending recommendation, posting for public comment and finally, publication. Active projects will have a target date posted for the project's expected completion. The dashboard will provide information to applicants around where their topics are in our process, provide information to outside organizations around the topics that we are currently working on and ways that they can get involved, and allow readers to identify the final recommendations made as well as any subsequent follow-up action taken on these recommendations.

Expanding our approach to communicating our work

An effective communications approach is crucial for ensuring that our work is widely visible, transparent and reaches the right audiences. We are committed to expanding our efforts to communicate our work to broader audiences in both the health system and public arenas. We will also continue to have an appeal mechanism for health technology assessment recommendations, and will consider developing an appeal mechanism for our other types of evidence-based recommendations as well.

In the coming months, we will be reviewing our approach towards developing and releasing "plain language" summaries of our products with an eye toward making these more publicly accessible. We will also be targeting an increasing number of evidence-based products for media releases and for the development of communications materials for relevant audience groups so they can share information about our recommendations with their communities. Over this past year, we have attracted substantial media attention for our End of Life Care review and accompanying OHTAC recommendations (43,44) as well as our Caesarean Section review (45). We will continue to select products for media profiling and other communications where there is a potential for substantial public interest, such as our upcoming Quality Standards for schizophrenia, major depression and dementia with agitation and/or aggression.

Evaluating our work and its impacts

HQO is fundamentally a learning organization: we can only learn by evaluating our efforts and drawing knowledge from both our successes and failures to guide our objectives for improvement. We are also committed to transparency in the way that we evaluate our work. The health technology assessment work previously done in the Ministry of Health and Long-Term Care as well as in the early days of HQO was periodically assessed by external experts, and these reviews were made public (46–48). We intend to continue this tradition.

Looking 3 years forward: What this plan will mean for Ontario

We have developed this plan to guide HQO's mandate to assist Ontario's health care system to become one that increasingly uses evidence to support decisions in policy and at the point of care. Such a system will lead to better health outcomes and a better experience for patients. Looking forward three years following the release of this plan, we hope to see an Ontario health care system with a number of positive, concrete developments relating to our work:

- Increasingly, decisions made in Ontario concerning investment in non-drug health technologies are informed by HQO's evidence-based recommendations. Through efficient working collaborations with research units in academia and health technology assessment organizations, HQO's pipeline for new assessments has expanded to accommodate the need for evidence from all parts of the health system, including growing demand from the primary care, home care and mental health and addictions sectors.

- Guided by HQO's evidence-based recommendations, an increasing proportion of portion of provincial health care spending is being redirected from relatively low-value services toward funding more effective care that is of high value to patients.

- HQO's growing library of Quality Standards is becoming a go-to source for patients and providers for key markers of quality care in an expanding range of populations, service areas and system issues. Health care organizations and providers are starting to be measured on their achievement of Quality Standards through a variety of vehicles including Quality Improvement Plans, service accountability agreements and both public and confidential reporting vehicles.

- New HQO Quality Standards are receiving significant attention upon their release and spurring focused provincial action to close the gaps they highlight.

- A growing number of major provincial health care decisions made around new policies and system reforms are informed by HQO's evolving process for comprehensively evaluating complex health system interventions. HQO works collaboratively with decision-makers to assist in the design of new initiatives.

- All evidence-based recommendations that HQO produces have been meaningfully guided by input from patients and/or caregivers.

Glossary

Complex health system interventions: Interventions that have a number of interacting components, target groups or organizations rather than or in addition to individuals, have a variety of intended outcomes, and are amenable to tailoring or iterative development through adaptation and learning by feedback loops, and where effectiveness is impacted by the behaviors of those delivering or receiving the intervention (49).

Evidence-based medicine: The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research (50).

Health technology: An intervention that may be used to promote health, to prevent, diagnose or treat acute or chronic disease, or for rehabilitation. Health technologies include diagnostic tests, treatments, devices, service models, programs and policies.

Health technology assessment: The systematic evaluation of the properties and effects of a health technology—including its clinical effectiveness, cost-effectiveness and its organizational, societal and ethical impacts—in order to inform decision-making (51).

Incremental cost-effectiveness ratio (ICER): A statistic used in cost-effectiveness analysis to summarize the cost-effectiveness of a health care intervention. It is defined by the difference in cost between two possible interventions, divided by the difference in their effect (52).

Meta-analysis: A statistical process that combines the findings from individual studies. A meta-analysis is typically performed in conjunction with a systematic review.

Quality-adjusted life year (QALY): A standardized measure commonly used in health technology assessment that takes into account both the quantity and quality of life generated by an intervention. It is the arithmetic product of life expectancy and a measure of the quality of the remaining life-years (53).

Systematic review: A critical assessment and evaluation of all research studies that address a particular clinical issue. The researchers use an organized method of locating, assembling, and evaluating a body of literature on a particular topic using a set of specific criteria (54).

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