Introduction to Implementation Research

Slide 2 & 3, Learning Objectives and Session Outline

Take the participants through the learning objectives; put IR into the context of the spectrum of health-related research and specifically as a sub-type of HSR.

Mention the need to identify specific ethical concerns in the conduct of IR that require special consideration beyond those for biomedical (clinical) research.

Briefly touch on the components of IR that will be elaborated in subsequent modules.

Slide 4

This is an introductory slide to the next few slides discussing and placing the various common forms of health-related research. Basic science does not always relate directly to humans; it may, for example, be conducted on tissue samples or animals, so, in addition to ethical obligations to humans, there may be animal ethics considerations. Emphasize that all forms of research complement our comprehensive understanding of health and disease, and how to maintain health, and prevent or treat disease in individuals and populations.

Slide 5

Using the diagram of WHO building blocks of the health system as one framework (not the only one) to look at the health system, illustrate how it is an overarching system that affects all aspects of health and health-care delivery, and how each component is necessary for the best functioning/effectiveness of the other components.

Slide 6

Using a major global public health problem, such as malaria, illustrate how understanding the pathophysiology of the disease, for example, that it is transmitted by mosquitoes, and how understanding the life-cycle of the parasite was crucial in combating the disease, and in studying the compounds that might be effective in curing the disease.

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Slide 7

Once pathophysiology is understood and products are identified as being effective through basic science, they must be tested in humans to determine safety. This requires clinical research. Once safety is determined, clinical trials should be conducted to determine whether the drug does indeed have the desired effect of curing malaria, and reducing morbidity and mortality. The trials need to be conducted rigorously (the gold standard is the randomized controlled trial or RCT) to objectively assess and quantify the benefits and harms. Multiple RCTs can be analysed in meta-analyses to provide best current evidence for individual treatment.

Special Note to facilitator: In this slide, one could discuss the RCT and what randomization and having a true control group means as well as the principle of clinical equipoise, i.e. true clinical uncertainty as to whether drug X is effective or better than drug Y, etc. The difficulty here is time; if only 1 hour is allocated for Module 1, then discussion of RCT shortens the time for the module. However, it is important that the participants understand the difference between clinical trials and IR. Therefore, it may be worth having this discussion here.

Slide 8

Discuss how much research in the past decades has focused on understanding medical diseases and the development of disease-specific therapies and products with the goal of improving health and minimizing associated risks in **individuals.** In the past, less attention had been paid to how these treatments/products reached the individuals affected on a broader scale.

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Slide 9

Introduce the idea that when studying disease pathophysiology and developing effective treatments for the individual, it should not be assumed that all who need the treatment will receive it. Attention must be paid to understanding whether a specific disease is indeed a relevant clinical burden within a country/region (i.e. responsiveness of research to the needs of the population) as well as the prevalence of the risk factors, or specific populations at risk, in order to develop strategies for disease control and management. This requires diligent epidemiological investigation including human disease incidence and prevalence, vector surveillance, etc. In the malaria example, population surveillance assists in the identification of the population most at risk (children under 5 years and pregnant women), and helps to target treatment to those who need it the most. Understanding vector control permits development of public health strategies to reduce transmission, e.g. increase uptake and the proper use of insecticide treated nets (ITNs).

Slide 10

Epidemiology and surveillance provide more information and lay the foundation for research to improve health-care delivery and health systems functioning, and provide information about access to care and health needs in the population. All components of the health system need to function well and in conjunction with each other for effective management, especially of diseases affecting public health.

Slide 11

This slide illustrates the continuum of health-related research and the feedback loop between epidemiology and surveillance and HSR. In themselves, epidemiology and surveillance are NOT IR but they provide the data upon which IR can be developed. Once a disease is recognized as a health priority, it is the responsibility of the health system to ensure equitable access to effective treatment. HSR, including IR, is designed to test potential solutions to improve access to and uptake of treatment or preventive interventions for highly relevant local health-care needs, for example, malaria in endemic areas. Such research is conducted in real-time and under real-life conditions. After the IR is conducted and an intervention is rolled out in a community, ongoing monitoring is necessary to detect effectiveness or failures, or any changes in disease patterns or in the health-care delivery process that require feedback and optimization of intervention strategies. Therefore, a continuous flow of information must be fed back to the health system to facilitate decision-making and resource allocation.

Slide 12

A review article by Remme et al. (2010) depicts the positions of operational research (OR) and IR within HSR. There are various ways to depict the position of IR within HSR; emphasize to the participants that this diagram is one illustration of the domains of HSR. Given the simplicity of this diagram, this is used here for practical purposes to illustrate where IR fits along the spectrum of HSR. This slide also identifies the target users of the information generated by the various forms of research and the generalizability of the research findings.

There is a progression from OR, which studies the very local application of interventions and the feedback loop is local, to IR, which studies interventions within local contexts but has broader applicability and generalizability. It is, therefore, of interest to programme managers who can feedback to the greater health system. HSR is the overarching form of research and also includes research into policy development and policy decision-making, financing and other health systems functioning; questions that may not include direct patient involvement although patients and/or the community are always the ultimate target of the research.

Once certain therapies are known to be effective in large numbers of patients, and given the responsibility of the health system to ensure equitable access to treatment, the next question is how to deliver this treatment optimally to as many people who need it, and in an affordable way that is accepted by the target communities and health-care workers. To answer these questions, OR and IR are required; OR and IR must be conducted in real-life circumstances to gain as accurate and realistic a picture of whether an intervention works under the local conditions, what barriers are encountered, how the intervention is accepted and how the strategy can be improved. Such information is crucial prior to scale-up and the widespread roll out of effective interventions.

Slide 13

The health system cannot function without a continuous flow of information and it, therefore, requires research to inform its policy development, decision-making, interventions and feedback.

Slide 14

Put the three questions to the participants one after another as a quiz. Distribute a set of the three colour cards to each participant to allow for the following three choices 1. HSR (yellow), 2. IR (blue), and 3. OR (red). Once the question is asked, participants raise the colour cards of their choice – drive the discussion (using the facilitator's notes for Slides 15–17) starting from the inappropriate to the most appropriate choice. Using the contents in slides 15, 16 and 17, summarize the definition of the three types of research.

Slide 15

More details on the specifics of HSR in its broadest form with the example of user fees – it is not intuitive to understand whether making users pay a very small fee for services will positively or negatively impact the uptake of services and misuse of services. Therefore, a study would need to be conducted on the impact of user fees. One can discuss some possible study designs as examples, e.g. the patients would be impacted if clinics were randomized to user fees or no user fees, or the study could be conducted using historical comparative data before or after the introduction of user fees in a specific district, in which case patients may be less directly impacted.

Whether patients would need to sign consent for such a study is questionable, as they would have no alternative except not to attend the clinic where fees were introduced. Such studies would inform policy about user fee implementation or not. Routinely collected clinic attendance data, with no patient identification could be analysed, and patients and health-care workers may, therefore, be unaware that the study was being conducted.

Slide 16

Description of IR using the example of testing whether giving rapid malaria tests to community health workers, instead of requiring patients to attend the health centre for diagnosis of malaria or the community health workers initiating empirical anti-malaria therapy. Delay in diagnosis and inappropriate treatment for malaria are identified as local health problems. Such a strategy could improve the rapidity of correct diagnosis and initiation of appropriate anti-malarial therapy, but studies would be needed to determine whether the strategy actually improved malaria diagnosis rates, treatment delays and outcomes, and whether it would also improve the appropriateness of referrals for non-malaria associated fever. Such a strategy could be rapidly scaled-up and rolled-out, and could be implemented elsewhere if found to be effective. It would, therefore, have implications beyond the community in which the intervention was tested.

Slide 17

Description of OR focusing on a local problem. Stress that OR is essentially a 'trouble shooting' process to address very specific and localized implementation problems, related, for example, to a specific health centre or small area where problems may not be occurring on a broader scale and would, therefore, have very little potential for generalizability. However, it may help to identify or overcome local bottlenecks that may not occur elsewhere, such as how to communicate medication instructions to refugees speaking various languages, at a specific location and with unknown literacy levels. A study of various packaging strategies could be conducted at the local health centres, which would provide feedback from participants on their comprehension and use of the medication. The most successful strategy can then be implemented locally to address the particular local barrier.

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Slide 18

Presents more examples of the practical application of known successful IR interventions in real-world situations. For example, on the one hand, how the use of ITNs reduced malaria infection, and, on the other hand, despite free distribution of ITNs, how the nets may not be used correctly. This may relate to the colour of the net, e.g. white signifying death or misinformation about how to use them, or the fact that it is free means it is not valued.

Another example is saving lives with the use of antiretroviral (ARV) drugs for HIV. There may be barriers that reduce uptake, such as stigmatization engendered by specific clinic attendance, or the requirement for an escort to bring a patient to clinic, or not being able to take time off work. Carrying out a campaign for mass drug administration (MDA) is not an end in itself, and clinical outcomes must also be monitored to assess the effectiveness of the campaign.

Slide 19

Demonstrates the important delays in translating knowledge into practice and highlights the need for IR to understand and overcome these delays.

Slide 20

IR studies practical application of known successful interventions in real-world situations where there may be different challenges anticipated with delivery and uptake of an intervention compared to what is already known. For example, the local understanding of disease may affect health-seeking behaviour. If fever is thought to have a spiritual origin, a community may be resistant to accepting a cure in the form of a tablet, or, in a very remote community, consistent delivery of drug supplies may be a challenge and undermine trust in the health system/clinics. It is important to study the process in order to carry out the intervention. In theory, the management of HIV and TB in the same patient should be easy to carry out in one visit. However, the extra time required for patients and health-care workers, and the broader scope of knowledge required may be barriers to successful implementation, and should be identified and studied to develop successful solutions. It is not enough just to study the process and to implement an intervention, but it is crucial to determine whether the ultimate goal, i.e. modification of the disease outcome has been successfully achieved. Clinical end-points should, therefore, be defined and evaluated in addition to monitoring the uptake and process of implementation, cost-effectiveness, etc. All of these components should be anticipated and incorporated into the study design.

Slide 21

The target audience of IR is people who can develop or change health policy, who can implement health policy and who can change local practice. These people also serve as important sources of information and feedback before, during and after a study. Their cooperation and collaboration is critical. It is also crucial that communities be informed of the results of IR, and that the outcomes of participation be fed back to them as research partners, to motivate them to continue with the uptake of behaviour change interventions. Because the participants do not often comprise researchers and scientists, it is important that the information be presented in an intelligible and concise way.

Slide 22

IR is conducted in the real world and, therefore, if a particular study intervention is the only local option to address a specific problem, it is fully understandable that the 'research' may seem indistinguishable from clinical care or public health practice. The line between clinical/public health practice and IR may not be easily drawn in certain circumstances. Similarly, where is the line or is there a line between quality improvement and IR?

This is a controversial topic, as many may feel that quality improvement or public health interventions do not require ethical review because they are a form of 'practice', whereas anything labelled as 'research' should be subject to ethical review. In reality, any intervention that has anything to do with a 'subject' or 'patient' should be conducted ethically, regardless of whether it is research or practice. If it is research, this implies something is unknown, there may be risk, and there may be opt-out possibilities, which may not always be the case with quality improvement or public health interventions.

There are differing views about whether or not quality improvement should be subject to ethical review. How could one determine whether a study is IR or quality improvement? Should consent be obtained in IR as well as quality improvement and public health interventions or only for IR?

Slide 23

Discuss strategies. IR is research, however, there are many factors that must be taken into consideration before a study is implemented and an intervention is tested that might then generate expectations that cannot be fulfilled. In the case of planning any IR, prior community and stakeholder engagement is crucial to assess the local acceptability of a proposed intervention. This is the case whether the intervention itself is appropriate as a potential solution to the identified problem, whether the study is feasible within the local circumstances, whether the intervention is/will remain cost-effective, equitable and sustainable and can, therefore, be scaled-up and rolled-out. All these factors will be elaborated in subsequent modules.

Slide 24

Discuss the main goals of IR, i.e. take evidence into practice, to improve practice and to provide information to policy-makers to inform decision-making/policy development.

Slide 25

Examples of the complexity of contextual/socio-political factors that impact design, conduct and uptake of IR and, therefore, must all be acknowledged, understood and considered before designing IR.

Slide 26

Examples of IR interventions. Discuss the examples. Bring up the point of EQUIPOISE that is most often contextual in IR, and invite participants to suggest possible approaches to answer the questions.

- Education: condoms reduce HIV transmission.
- Incentives: taxi vouchers to encourage institutional deliveries.
- Monitoring tools: in–house vector monitoring traps for malaria.
- Guideline implementation: timing of initiation of ARV in HIV.
- Multi–faceted packages: delivery of MDA and education about family planning and HIV prevention simultaneously in remote communities.
- New treatment methods: using Genexpert to diagnose multidrug–resistant tuberculosis (MDR–TB).
- Change in delivery systems: community health workers dispensing malaria treatment using rapid diagnostic testing (RDT).

Slide 27

Introductory slide of the phases of IR and the major ethical considerations within those phases which will be discussed in much further detail in the coming modules.

Slide 28

Conclusion slide. Emphasize the importance of IR – it is about translating knowledge into practice on a broad scale.