Transforming Data into Information
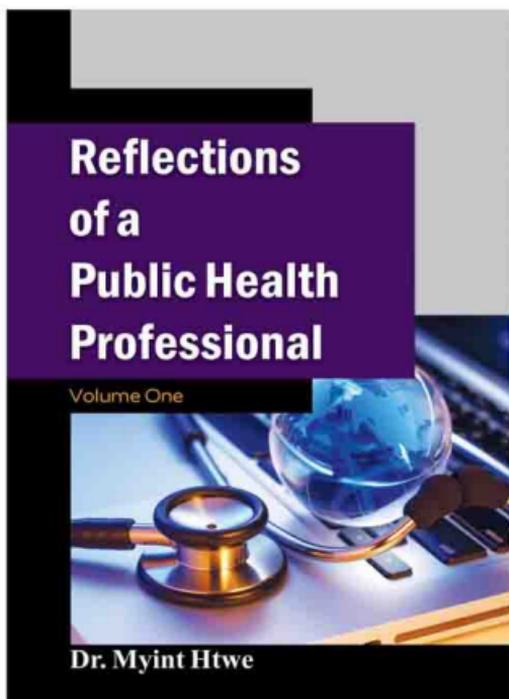

Reflections of a Public Health Professional

Volume One

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20. Transforming data into information

The health information system in developing countries has a huge amount of data. If these data are not transformed into information in time, it can be justifiably equated to an absence of data. The sizeable quantum of resources invested in the health information system will get lost. These data mines need to be cleared by applying basic statistical and reasoning methods so that they become very useful information. It can be used in (i) planning a programme; (ii) changing the course of action; (iii) intensifying or modifying the interventions; (iv) reducing or sun-setting programme activities; and (v) taking technical, administrative, management and logistic actions on several perspectives.

The utility of data can be dramatically increased and the value of data becomes very high if we know how to appropriately transform it into information. Health professionals serving at different levels of the health care delivery system should be trained on the methods by which we can transform data into information. We do not need sophisticated statistical methods to do this. Simple descriptive, inferential and analytical statistical methods will serve the purpose. But these must be interpreted using epidemiological thinking skill together with consideration of specific and respective programme issues.

A case in point is that if we analyze and interpret the raw data as such, we could find that "there is not a single case of benign prostatic hypertrophy or cancer prostate gland in female population". This statement is absolutely correct from the statistical perspective. In other words, some background knowledge on the issue at hand or programme specific perspectives need to be considered when data are transformed into information.

The same piece of data should be transformed into different types of information depending on the nature of work that the staff is performing. In other words, the thinking pattern or thought process on a piece of data or information should be different depending on the person who is transforming the data into information. The following scenario is depicted as an example.

Scenario: In a malaria-endemic area, 30 febrile persons with severe chills and rigors and some in a comatose state were admitted to a remote township hospital in the hilly area last night. This data/information was given to all categories of hospital staff early next morning. The following thought processes must immediately come into the minds of staff so that our health system performance can be at an acceptable level to serve the population effectively. Some sample thought process and queries are:

Thought process of a nurse: *(administrative - A, nursing care - NC and general thoughts - GT)*

(i)   I will be very busy with these malaria patients. I hope no seriously ill persons are there. (GT)

(ii)   I have to inform my nurse aid not to take leave during this week or so. I myself have to cancel my leave. (A)

(iii)   I may have to prepare for special nursing care for severely ill and comatose patients. (NC)

Thought process of a matron: *(management - M, administrative - A, and logistics - L)*

(i)   Do I have enough beds, pillows and bed sheets in the hospital? (M)

(ii)   Do I have enough antimalarial medicine in the hospital ward and store? (M)

(iii)   Do I have sufficient drip bottles and drip sets? In case, some of the patients are suffering from complicated malaria? (M)

(iv)   I need to inform the kitchen regarding the increased number of patients for diet requirement. (L)

(v)   How many nurses are taking leave today and during the week? (A)

(vi)   Do we have sufficient number of beds for 30 patients? Many attendants will also be there. (M)

Thought process of a TMO: (management - M, technical - T, administrative - A)

(i)   I have to check whether lab assistant is available tomorrow for blood testing. I hope reagents and rapid test kits are enough for the diagnosis. (M)

(ii)   I hope that required medicine and antimalarial medicines are not out of stock. (M)

(iii)   Could these patients be suffering from drug-resistant malaria? (T)

(iv)   What should I do if blood is required for complicated malaria? (M).

(v)   I may have to refer to the district or state/regional hospital if some patients are serious and dangerously ill. What about transport arrangement? (A)

(vi)   I may have to refer the latest WHO guidelines on the management of severe malaria. Luckily I have the latest edition. (T)

Thought process of a malariologist or epidemiologist: (technical - T)

(i)   Is this an unusual or seasonal occurrence of malaria cases in that area? (T)

(ii)   What is the age group of the 30 patients? (T)

(iii)   What is the gender of these 30 patients? Men generally go to work in the forest fringes or forest? Women generally are at home. If women constitute the majority, it may be a local transmission. (T)

iv)   Are thes relapse or recrudescence patients? (T)

(v)   Is there anyone under one monthold denoting local transmission? (T)

(vi)   What is the general trend of malaria in that area? (T)

(vii)   Is it an unexpected event or pre-outbreak situation deserving special attention to control malaria? (T)

(viii)   Are they migrants or residents from this area or what about the addresses of these patients? (T)

(ix)   Many probing questions on time, place, person; agent, host, environment and vector-related questions would come up. (T)

Thought process of state/regional public health director
(strategic - technical - ST, administrative - A)

(i)   He/she will think of the overall malaria control situation in that area (S-T)

(ii)   Trend of malaria patients admitted to that township hospital over the years for that area compared with other nearby townships (S-T)

(iii)   Staff deployment situation, any vacancy posts, etc. in that hospital. (A)

(iv)   Is the malaria control strategy effective or needs modification in that area? (ST)

Conclusion

The higher the hierarchical level of staff in the organization, the more strategic and policy level type of thought process will be there. The thought process of the Director-General will consider issues at the policy level in the context of state and regional variation and situation; policy and strategy of vector-borne diseases control, budgetary allocation; staff deployment and transfer, etc. The above scenario suggests that if all our staff, especially public health professionals, process and apply epidemiologic thought processes, we can serve the population more effectively on our path to Universal Health Coverage. Several in-service capacity building workshops on transforming data into information should be conducted for different categories of health workers working at different levels of the health care delivery system. The health

workers as well as the data gatherers will also know the value and importance of data and slowly data quality will be improved along the years.

References

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2. Presentation made by Dr. Myint Htwe at the inter-country workshop on *"Data Management for Evidence-based Decision Making"*, Bangkok, Thailand, 3-7 December 2001, (SEA-HS-221).
3. Concluding remarks made by Dr. Myint Htwe at the inter-country workshop on *"Strengthening Use of Health Information at the District level",* Bangkok, Thailand, 10-12 August 2009 (SEA-HS-326).