

Development of a Core Curriculum on Tuberculosis Control for Philippine Medical Schools

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Abstract

Introduction: As of 2001, the Philippines ranks 7th among the world's 22 countries with a heavy tuberculosis (TB) burden. As the country accelerates its campaign to control the global epidemic, the Philippine Tuberculosis Initiatives for the Private Sector (PhilTIPS) joined the efforts to combat it through the Directly Observed Treatment Short-course (DOTS) strategy and brought it to the level of medical schools. PhilTIPS commissioned this work to develop an evidence-based medical curriculum with strong and conscious integration of TB-DOTS. **Materials and Methods:** In the needs assessment, curricula, sample tests, and syllabi were reviewed. Deans and curriculum committee chairs were also asked to answer a questionnaire dealing with how TB, TB control and DOTS were taught. Based on the needs assessment, the TB control-DOTS core curriculum was developed. Ten months after its implementation, a monitoring evaluation was conducted through questionnaires, review of records and key informant interviews. **Discussion:** Representative samples of 18 out of 32 schools participated in the needs assessment and monitoring phase. Data revealed that the biomedical and clinical aspects of TB are emphasised in all schools. But only 7 out of 18 (38.89%) actually dealt with DOTS. A competency-based, integrated, and interactive TB-DOTS curriculum was then developed. The competencies around which the curriculum was designed were: (1) a thorough understanding of TB as a biomedical and social phenomenon; (2) the management of TB patients; and (3) an adherence to DOTS in managing TB patients. The curriculum was reviewed by local and international panelists, and implemented in 2003 to 2004. Monitoring evaluation 10 months later revealed that this curriculum was minimally to moderately integrated by medical schools. The study exhorts all medical schools to empower their graduates with competence in TB-DOTS.

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Introduction

Medical schools play an important role not only in the building of medical expertise but also in the socialisation of future physicians. Societies expect these institutions to train students to competently and holistically handle common health problems. As tuberculosis (TB) has been consistently listed as one of the Philippines' top 6 causes of mortality and morbidity over the last 2 decades, equipping medical graduates with the competence to manage TB is not just imperative but also urgent.

To address the problem of TB, the World Health Organization (WHO) adopted the Directly Observed

Therapy Short-course (DOTS) strategy in 1991, which the Philippine National Tuberculosis Control Program (NTP) also adopted in 1996.¹ However, studies showed that Filipino physicians still used multiple approaches in diagnosis, treatment, follow-up, monitoring and evaluation of their TB patients.²

As part of the Global DOTS Expansion Plan, attention was called to medical schools. The WHO, through the Coordination Advisory and Review Group of the Global Tuberculosis Programme (GTP), at a meeting held on 6 November 1996, recommended "*GTP should develop partnerships with the academic and scientific communities*

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and other units of WHO to ensure that relevant training materials, including the medical school curriculum... incorporate tuberculosis and the DOTS strategy.”³

This work was intended to address the concerns above. Based on the gaps identified in the way medical schools taught the concepts of TB-DOTS, it also endeavoured to provide said institutions with a curriculum model by which they could be taught more practically and integratively.

This paper describes the process of curriculum development, implementation, and short-term monitoring of TB control-DOTS core curriculum in Philippine medical schools.

Materials and Methods

Research Design

The process of curriculum development was done in 3 phases consistent with the research and development (R & D) design. This design includes gathering empirical evidence that identifies the need for an educational product, which then serves as the basis for the development and validation of the final product.⁴ In this study, the product referred to the core TB-DOTS curriculum.

The 3 phases were: (1) needs assessment. This was a descriptive survey of how medical schools in the Philippines were teaching TB, TB control and DOTS in their curricula, (2) development of a TB control-DOTS core curriculum, and (3) monitoring evaluation of the implementation of this core curriculum. The needs assessment was purely descriptive and did not test any hypothesis.

Data Collection Procedures and Analysis

In the needs assessment, primary data were obtained from a questionnaire. Said instrument was pre-tested among selected teachers from 2 medical schools in the national capital region (NCR). The questionnaire was administered to the deans, college secretaries and/or curriculum committee chairs during their annual convention in 2003. All queries and clarifications regarding the questionnaire were addressed during the administration of the instrument. The response rate was 56.25% (18 out of 32 medical schools). Respondents in this survey represented not just the 3 largest geographical divisions of Luzon (separate from the national capital region), Visayas and Mindanao; they also represented approximately 75% of the average number of graduates produced by the country from 2000 to 2002 (Table 1). Existing curricula and course syllabi, including sample instructional materials and examination papers, were received from 13 medical schools and reviewed. General and secondary references were also reviewed, namely investigations on TB-DOTS, how these 2 topics were covered in WHO reports, journal articles, bulletins, annual reports, manuals, samples of monographs

and core TB-DOTS curriculum used by other countries. Frequency distributions and descriptive statistics were used to organise and summarise the data. All other data were analysed qualitatively.

Based on the findings of the needs assessment, the TB control-DOTS core curriculum was developed. The design included defining core competencies that medical graduates should develop, completing the template for both subject-centred and problem-based curricular tracks, validating the new core curriculum by international and local panelists (including the deans of medical schools) and getting the commitment of all schools to implement the curriculum.

Monitoring evaluation of the curriculum was carried out after 10 months of implementation. A questionnaire was constructed to find out the schools' experiences in implementing the TB-DOTS core curriculum. Just like the needs assessment survey, said instrument was pre-tested to selected teachers from 2 medical schools. Respondents included 18/32 (56.25% response rate) medical schools representing administrators, project implementers, and faculty members handling the courses where TB-DOTS concepts were integrated. Out of the 18, 15 (83.33%) attended the validation of the core curriculum in 2003 and 10 (55.55%) served as respondents in the needs assessment (Table 1). Records, course outlines, syllabi, teaching-learning resources and activities, and assessment tools were reviewed and analysed for consistency and validity. Key informant interviews with master TB educator awardees regarding their experience in implementation were likewise conducted. This established the methodological triangulation of the study. Quantitative data were analysed using summary statistics while qualitative data were analysed by content and context.

Findings from Needs Assessment

Profile of participating schools: Seven schools (38.9%) were under the subject-centred curriculum; the rest reported to have a combination of varied trends, e.g., being community-oriented, competency-based, integrated, public health-oriented, and problem-based. Since all deans, college secretaries, and curriculum committee chairs have been extensively trained on curriculum planning not only in relation to this study but also during their annual conventions with the Association of Philippine Medical Colleges (APMC), direct written responses on the labels and descriptions of their respective tracks were taken as valid descriptions. Subject-centred tracks pertained to those literally based on the various disciplines and the way they are arranged in the programme, e.g., basic sciences in the first 2 years followed by 2 years of clinical sciences and patient encounters. The last group of schools refers to those following several innovations and advocacies from being competency based, integrated, community-based, and

Table 1. List of Participating Medical Schools, their Geographical Locations and Mean Number of Graduates from 2000-2003 (n = 18)

Name of medical school	Geographic location	Average no. of graduates	Respondent in the needs assessment	Respondent in the monitoring
1. Emilio Aguinaldo College	NCR	20	X	/
2. Manila Central University	NCR	35	X	/
3. Pamantasan ng Lunsod ng Maynila	NCR	29	/	X
4. University of the Philippines College of Medicine	NCR	152	/	/
5. St. Luke's College of Medicine (SLCM)-William H Quasha Memorial Inc	NCR	88	/	/
6. University of the East Ramon Magsaysay Memorial Medical Center	NCR	211	/	/
7. Far Eastern University	NCR	258	/	X
8. University of Santo Tomas	NCR	368	/	/
9. Angeles University Foundation	Luzon	23	/	X
10. Lyceum Northwestern	Luzon	20	/	/
11. De La Salle University	Luzon	151	X	/
12. St Louis University	Luzon	35	X	/
13. University of Perpetual Help	Luzon	25	/	X
14. West Visayas State University (WVSU)	Visayas	61	/	/
15. Cebu Doctors College of Medicine (CDCM)	Visayas	50	/	/
16. Gullas Medical College	Visayas	50	/	/
17. Southwestern University	Visayas	82	/	/
18. Iloilo Doctors College	Visayas	50	/	/
19. Cebu Institute of Medicine	Visayas	78	/	/
20. Xavier University (XU)	Mindanao	25	/	/
21. Mindanao State University (MSU)	Mindanao	23	/	/
22. Davao Medical School Foundation (DMSF)	Mindanao	61	/	/
Grand mean in 3 years		1465	n = 18	n = 18

NCR: national capital region

Sources: Association of Philippine Medical Colleges through its Executive Director, and The Colleges of Medicine of the University of the Philippines and the St. Luke's Medical Center-William H Quasha Memorial Inc.

public-health based. These institutions have eclectic tracks reflecting the heterogeneity of values and thrusts of these institutions, e.g., public/private, sectarian/non-sectarian, community oriented/community-based, and integrated/innovative.

The teaching of TB-DOTS in Philippine medical schools: All 18 participating medical schools answered affirmatively that their graduates were equipped with the necessary knowledge, skills and attitudes in TB-DOTS management. Seventeen (94.60%) stated that such concepts were being integrated in the teaching of TB. However, Figure 1 qualifies the depth of how TB, TB control, and DOTS were being emphasised in their schools. Respondents reported that they integrate and emphasise pathogenesis, epidemiology, treatment and prevention of TB in the various subjects. Around 95% of them take up clinical presentation of TB

disease in detail. However, only half of them emphasised follow-up evaluation and compliance to DOTS strategy. These quantitative data were validated qualitatively through the respondents' actual written curricula, syllabi, and sample instructional materials. Only 7 (38.8%) schools explicitly named DOTS as one of the primary focuses in their approach to teaching TB. Yet even among these 7 schools, the focus remained on the biomedical aspects of TB as confirmed in their actual sample handouts, written, oral, and practical examinations, laboratory exercises, case presentations, and case reports.

Based on these findings, a more concrete and comprehensive vertical and horizontal integration of TB control and DOTS was recommended not just in Philippine medical schools but also in the allied medical professions like nursing, medical technology and pharmacy.

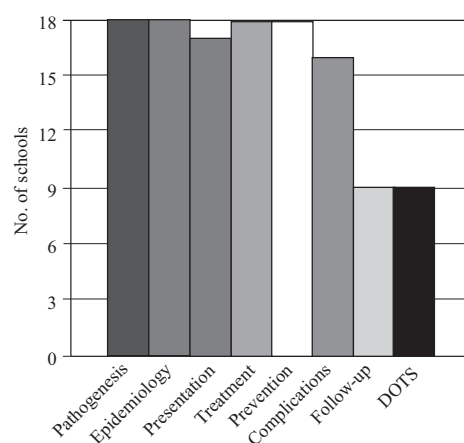


Fig. 1. Different aspects of TB control-DOTS emphasised in Philippine Medical School (n = 18).

Development of Core Curriculum

The core curriculum on TB-DOTS that this study developed has the following features: It is (1) competency-based, (2) interactive in teaching-learning strategies and instructional resources curriculum, and (3) vertically and

horizontally integrated. The major competencies identified were: (1) demonstration of thorough understanding of TB as a biomedical and social phenomenon; (2) evaluation of patients with PTB and the more common forms of extrapulmonary TB according to standardised criteria; and, (3) adherence to DOTS in managing TB patients.

The competency-based template is acceptable to schools of any track because the learning outcomes expected in the programme can (1) be easily demonstrated and evaluated, (2) cover knowledge, skills, and attitudes and therefore go beyond rote memory learning and being purely biomedical, and (3) already suggest what the corresponding curricular components should be, namely specific objectives, outline of contents, choice of teaching-learning activities, and assessment of student achievement thereby providing built-in opportunities for vertical and horizontal integration.

The curricular framework developed in the study is synthesised in Figure 2. In the biological aspects, the aetiology, transmission, pathogenesis, clinical presentation, diagnosis and management are all covered. These topics are culled from various subjects and covered in varying depths across year levels, i.e., the first to fourth years. As

Table 2. Excerpts from the TB-DOTS Core Curriculum (First to Fourth Years)

General competency	Specific objective	Subject matter	Subjects for integration	Activities	Resources*	Assessment
Demonstrate thorough understanding of TB as a biomedical and socio-psychological phenomenon	Appreciate the local and global TB burden of disease and its implications	Most recent local and global TB burden of disease, implications to the individuals, family, community, and the country	Family and Community Medicine Suggested for First Year • Research Epidemiology • Introduction to Patient Care	Complete Module 1 Discuss case studies in small group discussion setting Presentation of a TB patient as resource	Module 1 Case history Power Point presentation (see Virtual Resource Library)	Written examinations Written case history report Appraisal of literature on TB burden of disease
	Discuss the beginning, growth, treatment, prevention, and management of TB	Discuss the important virulent factors of the agent, in relation to the pathogenesis of TB, host response, and laboratory diagnosis; enumerate the current mode of treatment	Suggested for first to fourth year • Microbiology • Pathology • Physiology • Pharmacology	Presentation of a TB patient as resource Prescription making exercises Trace beginning, growth, etc of the TB disease based on a case history of a patient	Module 1 Case history Power Point presentation (see Virtual Resource Library) Prescription exercises	Prescription exercises Case report Written examinations
	Follow standard procedures in performing and interpreting sputum smears	Steps in performing sputum smear, criteria for interpreting smears, compliance with DOTS standard procedures	Suggested for first or second year • Microbiology	Lecture Laboratory	AFB slides Microbiology laboratory Module 2 NTP Manual of Procedure	Written and practical examinations

TB-DOTS: Tuberculosis-Directly Observed Treatment Short-course

* All resources cited herein are available in the TB Resource Library component of the core curriculum. The electronic version is accessible at <http://www.philips.org>

Year Level	4 th	Full patient responsibility, DOTS, referral			
	3 rd	Prevention of transmission of disease	Prophylaxis	Diagnosing patients	DOTS strategy for managing TB
	2 nd	Biological characteristics	Disease transmission Nature of disease	Diagnosis of TB (clinical and sputum)	Drug therapy (recommended for DOTS)
	1 st	Relevance TB burden Epidemiology	Biomedical factors (Lung defenses; immune response)	Social aspects Health-seeking behaviour	Impact of DOTS as means of eradicating TB Consequence of no DOTS
		Subject matter: Basic Science		Clinical medicine	

Fig. 2. Curricular framework of integrating TB in Philippine Medical Curriculum

a social phenomenon, this curriculum deals with the epidemiology, burden of disease, and socio-psychological, economic and political characteristics of TB. This entailed the integration of another set of disciplines. It is so designed precisely to establish in the students a strong grasp of TB, TB control and DOTS from years 1 to 4. In the end, students should have a logical and coherent understanding of the TB phenomenon throughout their entire medical training. Table 2 presents an excerpt of the curriculum containing all curricular elements made consistent with the 3 features and the first general competency discussed above.

Short-term Monitoring

Actual implementation of the core TB-DOTS curriculum was done over 1 school year, from June 2003 to March 2004. This short duration limited the monitoring into a process evaluation; hence, the study did not attempt to establish how the core curriculum translated into actual

student competencies. Process evaluation asks how well the plan is being implemented, what barriers threaten its success, and what revisions are needed to improve the programme.⁵ In this last phase of the study, primary data were obtained from a rating scale focusing on curricular components that respondents rated according to their perceived degree of implementation. The scale ranged from 1: not using the TB-DOTS core curriculum, 2: minimally integrated, 3: moderately integrated and 4: fully used or integrated. Respondents included deans, college secretaries, curriculum committee chairs, and faculty members who taught TB in various courses. These perceived degrees of integration were recorded as frequency counts and later transformed into mean ratings. These quantitative data were triangulated with qualitative data derived from course syllabi, instructional resources, sample tests, and other reports received.

Table 3. Frequency Distributions, Means and SDs of Respondents' Ratings on the Extent of Their Integration of the TB-DOTS Core Curriculum (n = 17*)

Elements of the TB Control-DOTS Core curriculum rated	Frequency per rating				Mean	SD
	1	2	3	4		
1. Conscious attempt at achieving competencies/objectives set	4	5	4	5	2.51	1.19
2. Inclusion of TB-DOTS in prescribed year levels	5	1	10	2	2.48	1.05
3. Covering suggested subject matter in selected courses or modules	4	3	6	5	2.56	1.14
4. Following the recommended sequence of topics	5	4	8	1	2.24	0.97
5. Emphasis on key concepts related to TB control and DOTS	5	5	4	4	2.43	1.16
6. Carrying out of recommended topics for lectures and other large group presentations	4	4	8	2	2.41	1.00
7. Carrying out of recommended topics for small group tutorials and interactive sessions	5	3	7	3	2.43	1.10
8. Reinforcing large and small group activities with packaged TB-DOTS resource library provided in CD version	5	8	2	1	1.95	0.87
9. Using TB-DOTS module series	5	4	7	1	2.19	0.98
10. Using given cases and exercises	5	5	5	2	2.18	1.04
11. Application of suggested evaluation methods	5	1	6	4	1.95	0.91

SD: standard deviation; TB-DOTS: Tuberculosis-Directly Observed Treatment Short-course

* MSU was not included in the processing of data for statistical analysis because respondent described how the integration was done in said school using narratives.

Scale Legend: 1: Not integrated, 2: Minimally integrated, 3: Moderately integrated, 4: Fully integrated

Table 4. Observer's Notes from the Actual Clerkship Rotation in Medicine in DLSU

Learning objectives (8 to 12 students)	Teaching - learning activities per block
Discuss the diagnostic criteria for PTB in particular patients enrolled in the TB-DOTS programme	8:00-12:00 a.m. – first block rotates at the Tuberculosis Research Unit (TRU) and sees actual patients who come for consultation.
Categorise patients based on recommended criteria, both clinical and diagnostics, according to NTP guidelines	Students meet the new patients, interview them, obtain history, perform physical examination and advise accordingly. Part of the standard procedures clerks perform includes advising patients on how to collect sputum specimen. They also perform PPD examination and assist the medical technologist on duty in examining the specimen. The clerks who assist the nurse on duty in accomplishing the official records and administration of the drugs likewise meet old patients who come for their drugs.
Explain the 5 components of the DOTS strategy	1:00-3:00 p.m. – Clerks attend preceptorials facilitated by a consultant. Clerks are expected here to present their case findings based on actual patients they have seen in the TRU.
Formulate the appropriate treatment plan using anti-TB chemotherapy according to NTP policy, treatment category of patients and special indications	Included in their case discussions are checking the appropriate forms filled up by the nurse on duty which clerks need to use as references in their presentations. In the entire rotation, clerks need to interact constantly with patients, their relatives, consultants and the TRU staff. This clinic is approximately 40 sq. meters in floor area so they really could not afford to be cordial and professional in their interaction with others.
Maintain a legible and accurate recording system of patients assigned to them	3:00-5:00 p.m. – Clerks engage in independent study and/or meet with their block mates in preparing their project for their TRU rotation. This project may be any learning material that patients at TRU may use in knowing more about TB-DOTS. Sample works include comics magazine, a video production, etc. which integrates the clerks' theoretical and practical understanding of TB-DOTS.
Demonstrate professional attitudes and habits such as honesty, compassion and respect towards patients, relatives and co-workers	

DLSU: De La Salle University; PPD: purified protein derivatives test; PTB: pulmonary tuberculosis; TB-DOTS: Tuberculosis-Directly Observed Treatment Short-course

Extent of integration of the core curriculum among Philippine medical schools: Table 3 presents the mean ratings, standard deviations, and frequency distribution of respondents according to the curricular components that they rated in terms of perceived degree of implementation. The data showed that for most components, the TB-DOTS core curriculum had only been minimally to moderately integrated, as reflected by means ranging from 1.96 to 2.56. Respondents reported moderate integration toward the competencies set by the core curriculum (2.51), the inclusion of basic TB concepts in different year levels (2.48), and how these are integrated (2.56), sequenced (2.24), and emphasised in various subjects (2.43). The use of large and small group activities was likewise moderately integrated (2.41). However, respondents hardly used the resource materials in the core curriculum. The modules (2.19), cases, exercises, (2.18) and the packaged activities to reinforce the large and small group discussions (1.95) were mostly not used or minimally integrated. The succeeding discussions explain the factors that facilitated or hindered the implementation.

Key respondents who shared their experiences in integrating the various elements of the TB control-DOTS curriculum validated the perceived mean ratings above. Patterns of responses were studied and revealed 2 main factors that affected their implementation. The first factor was political commitment. Administrative problems like a

lack of coordination between and among departments, the difficulty of assigning new topics to the faculty, and poor attendance during the training of the faculty on TB-DOTS core curriculum, were persistently identified as obstacles to smooth implementation. This was aggravated by a marked position of clinical faculty members to teach TB the way they used to, as opposed to the template suggesting socio-psychological integration. These required strong political will of the local school leadership. *"When deans and their teams were not as strong-willed to implement the core curriculum, some topics became redundant while others were either underemphasised or overemphasised,"* summarised a master TB educator awardee.

The other factor referred to logistical support. The majority of respondents reported that adequate support referred to having competent faculty members assigned to teach TB-DOTS topics. Inadequate logistics meant having faculty members who did not have the confidence to teach said topics and ended up handling the usual discipline-based topics. Logistical support was also instrumental in having an operational TB-DOTS centre and catchment communities where medical students could rotate. Various teaching-learning activities in the TB-DOTS core curriculum included a community or TB-DOTS centre and without these, integration would seem superficial. Out of the 18 medical schools, 9 disclosed in interviews that their clerks and interns rotated at their DOTS centres. Out of the 3 master

TB educator awardee medical schools, the case of De La Salle University (DLSU) stood out in terms of full integration. Table 4 presents a sample clerkship rotation in the Department of Medicine actually observed by the researchers. The design shows the depth of integration pervading the objectives, content, teaching and learning activities. At the end of the 1-week rotation, students submitted educational materials for patients and their relatives who visit the centre daily for their supply of TB drugs.

The other problem was lack of logistical support. A few respondents reported that they could not fit TB-DOTS into their curriculum because of the latter's rigidity. These basic problems could only be solved through increased financial support or strong political commitment. Respondents suggested that, in order to fully implement the curriculum, a point person should be designated to monitor how the core curriculum is actually being implemented from the first to fourth years, and from basic to clinical sciences.

Conclusions and Recommendations

Philippine medical schools were confident as to the readiness and competence of their graduates to manage TB. They reported that the components of TB are adequately covered in the subjects spread out in 4 years of medical education. However, only the biomedical and clinical aspects of TB are emphasised. Specific areas in the different subjects or modules where TB control and DOTS were introduced and covered were wanting.

A competency-based, horizontally and vertically integrated curriculum that utilised interactive teaching and learning strategies was developed for subject-centred and problem-based curricular tracks. Ten months after its implementation, this curriculum was minimally to moderately integrated in medical school curricula. Political

commitment and logistic support affected its implementation. This 3-phase study, done from 2003 to 2004, yielded a template core curriculum on TB-DOTS. Schools are at liberty to adopt it in its entirety or in part. But as long as TB continues to plague the country, empowering future physicians with competent knowledge of TB and DOTS remains a most viable solution.

Based on the experience, we suggest the following:

1. Full integration of the TB control-DOTS curriculum across all levels and medical schools in the Philippines;
2. Faculty orientation and training on implementing the curriculum in their classes;
3. Access to instructional materials on TB control and DOTS;
4. Administrative support for the full implementation of the curriculum; and
5. Twinning between schools (i.e., close mentoring between schools with strong TB-DOTS programmes like the Master TB Educator Awardees and a relatively neophyte school)

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