HEALTH RESEARCH PRIORITIES
REGION 11
2006-2010

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DAVAO REGION

GEOGRAPHY

Location

Davao Region is located in the southeastern portion of the island of Mindanao and lies between 5º20" and 9º30" north latitude and 124º20" and 126º35" east longitude. It is bounded on the North by the provinces of Surigao del Sur and Agusan del Sur; on the South by the Davao Gulf and Celebes Sea; on the East by the Philippine Sea and on the West by the provinces of Bukidnon, North Cotabato and Sultan Kudarat.

MAP OF DAVAO REGION

Land Area

It is composed of four (4) provinces namely: Compostela Valley, Davao del Norte, Davao Oriental, Davao del Sur and four (4) component cities of Davao, Tagum, Digos and the Island Garden City of Samal. It has 43 municipalities and 1,158 barangays (please see Table 1). Almost a third (29.1%) of these barangays are located in the 14 municipalities and one city (Davao City) of the province of Davao del Sur.

Table 1. Number of Municipalities/Component Cities and Barangays, By Province and City, Davao Region, Philippines, 2004

Province/City	No. of Municipalities	No. of Component Cities	No. of Barangays
Compostela Valley	11	0	235
Davao del Norte	7	3	223
Davao Oriental	11	0	183
Davao del Sur	14	1	337
Davao City	0	0	180
Davao Region	43	4	1,158

Source : Annual Health Report 2004, DOH-CHD-Davao Region

Davao Region occupies a land area of 19,672 square kilometers. Table 2 shows that of the four provinces, Davao Oriental has the largest land area of 5,164 sq. km. occupying more than a quarter (26.3%) of the region's total land area. Davao del Norte occupies the smallest land area of only 3,463 sq. km. Davao City, which is the administrative center of the region, covers a land area of only 2,444 square kilometers which is about 12% of the total land area of Davao Region.

Table 2. Land Area, By Province and City, Davao Region, Philippines, 2004

Province/City	Land Area (sq.km.)	% Distribution
Compostela Valley	4,667	23.7
Davao del Norte	3,463	17.6
Davao Oriental	5,164	26.3
Davao del Sur	3,934	20.0
Davao City	2,444	12.4
Davao Region	19,672	100.0

Source: Davao Region Statistical Yearbook 2003 cited from the Annual Health Report 2004, DOH-CHD-Davao Region

Population Growth Rate, Size, and Density

Based on the annual growth rate per municipality, the projected population of the region for 2004 is 4,049,479. The average annual growth rate is 2.36%. In Table 3, it is shown that among the provinces and cities of Davao Region, Davao City has the biggest population of 1,285,017 which contributes to almost a third (31.7%) of the total population of the Region. Of the four provinces, Davao Oriental has the least population of only 476,113 persons or about 11.8% of the total population of Region XI.

Table 3. Projected Population, By Province and City, Davao Region, Philippines,2004

Province/City	Land Area (sq.km.)	% Distribution
Compostela Valley	639,667	15.8
Davao del Norte	811,424	20.0
Davao Oriental	476,113	11.8
Davao del Sur	837,258	20.7
Davao City	1,285,017	31.7
Davao Region	4,049,479	100.0

Source : 2000 NSO Census and Annual Growth Rate per Municipality cited from the Annual Health Report 2004, DOH-CHD-Davao Region

Overall, the population density of Davao Region is 206 persons per sq. km., with Davao del Norte having the highest population density with 234 persons per sq. km. and Davao Oriental the least with 92. The population density of Davao City, at 526 persons per sq. km., is two-and-a-half times that of the region.

Age and Sex Distribution and Dependency Ratio

Table 4 shows that during the year 2004, there was a predominance of the male population (51.05%) vis a vis the female population (48.95%) in the region. Of the total population of 4,049,480, a total of 1,652,122 (40.8%) belonged to the young and old population (0-14 years old and 65 years old and above). On the other hand, 2,397,358 or 59.2% belonged to the productivity ages of 15-64 years old. The dependency ratio of the young and old population to those of the working population was estimated at almost 69%. This indicates that for every 69 young and old dependents, there are 100 economically active persons who provide support for their needs.

Table 4. Population by Sex and Age Group, CHD-Region XI, Philippines, 2004

Age-Group	Sex				TOTAL	%
	Male		Female			
	Number	%	Number	%		
0-<1	48,834	1.21	47,323	1.17	96,157	2.37
1-4	206,336	5.10	198,796	4.91	405,132	10.00
5-9	264,964	6.54	253,029	6.25	517,993	12.79
10-14	253,902	6.27	247,808	6.12	501,710	12.39
15-19	220,158	5.44	221,446	5.47	441,604	10.91
20-24	192,272	4.75	185,904	4.59	378,176	9.34
25-29	166,063	4.10	157,561	3.89	323,624	7.99
30-34	149,758	3.70	141,906	3.50	291,664	7.20
35-39	132,543	3.27	124,396	3.07	256,939	6.34
40-44	115,162	2.84	106,655	2.63	221,817	5.48
45-49	92,313	2.28	84,865	2.10	177,178	4.38
50-54	68,779	1.70	62,788	1.55	131,567	3.25
55-59	49,289	1.22	45,603	1.13	94,892	2.34
60-64	41,360	1.02	38,537	0.95	79,897	1.97
65-69	27,021	0.67	26,311	0.65	53,332	1.32
70-74	18,604	0.46	18,087	0.45	36,691	0.91
75-79	10,515	0.26	11,023	0.27	21,538	0.53
80-84 and above	9,232	0.23	10,337	0.26	19,569	0.48
TOTAL	2,067,105	51.05	1,982,375	48.95	4,049,480	100.00

(Source : NSO cited from the Annual Health Report 2004, DOH-CHD-Davao Region)

Population of Ethnic Groups

Davao Region has a blend of various cultures. Christians and Muslims live in harmony together with the different ethnic tribes such as : B'laan, Bagobo, Manobo, Mandaya, Ata-Talaingod, Mansaka, Dibabaon, Sama, and Manguwangan. In 2002, a total of 525,552 residents belonged to the cultural communities representing 14.3% of the total population of Davao Region and about 4% of the total population of the Island of Mindanao.

RESOURCES PROFILE

Climate

The climate of Davao Region falls under two categories namely: Type II which is characterized by the absence of a dry season and very pronounced rainy period from November to January, and Type IV which is characterized by rainfall evenly distributed throughout the year. Davao Oriental and the western part of Davao del Norte belong to Type II category while Type IV occurs in Davao City, Davao del Sur, and other areas of Davao del Norte.

The climate of the Davao Region is highly favorable to agricultural production. The region is neither hit by typhoons nor by low pressures that usually pass over the Philippine archipelago between Luzon and the southern tip of Samar. Wind speeds during the year are under 10 kilometers per hour.

Topography and Erosion Susceptibility

The region is characterized by mountainous areas, basins with uneven plateaus, lowlands and swamps. Of the total land area of Davao Region, about 25% are represented by lowlands which are characterized by 0-8% slope. The uplands constitute about 16% of the total land area. These are characterized by slope of 8-18% which include the residual terraces, foot slopes, low hills and plateaus.

A total of 16,835.6 sq. km. or approximately 86% of the total land area in Davao Region have already been subjected to various forms of erosion. Of these, a total of 8,474 sq. km. have severe erosion, particularly those with slope of 18% and above (from rolling areas to very steep hills and mountains).

Land Classification and Land Use

A total of 11,673 sq. km. or 59% of the total land area of Davao Region constitute forestlands while the rest of the areas are classified/certified alienable and disposable lands. More than a quarter (26.7%) of the forestlands are found in Davao Oriental.

The economy of Davao Region is predominantly agriculture-based, with approximately a third (34.4%) of the land area used for agriculture.

Land Resources

Given its vast agricultural resources, the export commodities of Davao Region are thus mainly agricultural products. From January to December, 2004, export products were mainly coconut oil, banana, pineapple, rubber, dessicated coconut, and plywood.

Table 5 presents the region's major agricultural products, with corresponding volume produced and area harvested in hectares as of 2004. Coconuts are the most widely produced agricultural product in the region. Almost 2.5 million metric tons of coconuts are harvested from a total land area of 379,865 hectares, contributing to about 17.3% of the country's total production.

Bananas ranked second as to volume produced in the region. In 2004, the region has produced about 2.3 million metric tons which contributes almost half (41%) of the total banana production of the country's 5.6 metric tons harvested. Sugarcane ranked third with a production of 594,260 metric tons. Palay is also widely grown in Davao Region. In

2004, about 472,467 metric tons of palay were harvested from a total land area of 110,754 hectares. Other major agricultural products registered in 2004 are corn, mango, coffee, pineapple, rubber and abaca.

Table 5. Volume and Area of Production of Major Agricultural Products, Davao Region, 2004

Product	Production in Metric Tons	Area Harvested in Hectares
Coconut	2,478,426	379,865
Banana	2,308,773	66, 561
Sugarcane	594,260	11,346
Palay	472,467	110,754
Corn	244,316	204,436
Mango	32,382	8,770
Coffee	30,586	29,683
Pineapple	18,104	2,164
Rubber	15,597	6,358
Abaca	11,462	10,570

Source : 2004 Mindanao Development Statistics

Mineral Resources

Davao Region is also endowed with different metallic and non-metallic mineral deposits. Table 6 shows that chromite, laterite and garnierite ore reserves are abundant in Davao Oriental. Large deposits of primary gold ore of about 18.7 million metric tons and enormous amounts of primary copper ore estimated at 185.5 million metric tons are deposited in Compostela Valley. Iron magnetite sand deposits of about 4 million metric tons are found only in the province of Davao del Sur.

Table 6. Metallic Ore Reserves by Province, Davao Region

Province	Type of Minerals	Location	Estimated Deposits In Metric Tons
Davao Oriental	Chromite Ore	Governor Generoso	88,077
	Laterite Ore	Mati	220,000,000
	Garnierite Ore	Mati	255,710,582
Compostela	Primary Gold Ore	New Bataan	15,594,689
		Maco	1,214,098
		Mabini	924,297
		Pantukan	1,000,000
	Primary Copper Ore	Maco	29,298,927
		New Bataan	50,700,000
		Pantukan	105,491,940
Davao del Sur	Iron Magnetite Sand		4,000,000

Source : Department of Environment an Natural Resources - Region XI

Gold Mining Operations in Davao Region

The gold rush sites in Davao Region are located in the province of Compostela Valley. Tables 7.1 to 7.4 show the data provided by the Bureau of Mines of Davao Region concerning the small scale mining industries operating in the municipalities of Monkayo, Pantukan, Nabunturan, Compostela and Maco as of July, 2004. Most of the mining industries are using gold cyanidation instead of amalgamation process to extract gold from the ore. Cyanidation is a technique which uses cyanide, a highly toxic substance, while amalgamation process uses mercury to extract gold which is criticized as an occupational and environmental hazard. The Bureau of Mines reported that about

90% of the mining operators in Davao Region resorted to gold cyanidation while the rest are still using amalgamation process.

In Table 7.1, about 2,700 miners were employed in six documented mining industries located in Diwalwal, Monkayo, Compostela Valley. These mining sites used cyanide to extract gold from the ore while the effluents were disposed in the tailings pond. An undetermined number of workers were employed in several small scale mining operators using both amalgamation method and cyanidation. Wastes were deposited in the settling pond.

Table 7.1 Active Small-Scale Gold Mining Operations in Monkayo, Compostela Valley, 2004*

Active Small Scale Mining Operators	Location	Estimated No. of Workers	Mode of Recovery & Tailing Disposal	Tailing Disposal
1. BLUCOR Mining	Vietnam District, Diwalwal, Monkayo	100	Cyanidation	Tailings Pond
2. BULBSCOR Mining	Vietnam District, Diwalwal, Monkayo	600	Cyanidation	Tailings Pond
3. HELICA/ AUSTRALIA	Vietnam District, Diwalwal, Monkayo	800	Cyanidation	Tailings Pond
4. J.B.Management Mining Corporation	Buenas District, Diwalwal, Monkayo	600	Cyanidation	Tailings Pond
5. Bullex Mining	Vietnam District, Diwalwal, Monkayo	500	Cyanidation	Tailings Pond
6. MDAC	Vietnam District, Diwalwal, Monkayo	100	Cyanidation	Tailings Pond
7. Several Small Scale Mining Operators	Diwalwal, Monkayo	-	Amalgamation &cyanidation	Settling Pond

*With and without permit, expired and on process as of July 28, 2004

Table 7.2 shows that 3,000 workers were employed in the gold rush areas of Pantukan, Compostela Valley. Of these, about 26.7% were working in recognized mining industries which used cyanide while a large proportion of 73.3% were employed in various small scale mining operations which used both amalgamation process and cyanidation for gold extraction. Effluents of these small scale mining industries were deposited in the settling pond.

On the other hand, Table 7.3 reveals that a smaller number (350 workers) were employed in recognized gold mining industries in Nabunturan, Compostela Valley. More than half of these workers (57.1%) were employed in the mining sites which used amalgamation process. An undetermined number of workers in several active small scale mining industries in Bukal, Nabunturan, Compostela Valley were likewise using amalgamation process.

About 200 workers were employed in mining sites in Compostela, Compostela Valley which used cyanide for gold extraction. In Maco, an undetermined number of miners were involved in the industries which used amalgamation process (pls. see table 7.4).

Table 7.2. Active Small-Scale Gold Mining Operations in Pantukan, Compostela Valley, 2004*

Active Small Scale Mining Operators	Location	Estimated No. of Workers	Mode of Recovery & Tailing Disposal	Tailing Disposal
1. HEXAT Mining	Diat, Napnapan, Pantukan	200	Cyanidation	Tailings Pond
2. Several Small Scale Mining Operators	Diat, Napnapan, Pantukan	300	Amalgamation & cyanidation	Settling Pond
3. Butchoy II Corp.	Panganason, Nap- napan, Pantukan	100	Cyanidation	Tailings Pond
4. PGO Tunnel	Panganason, Nap- napan, Pantukan	200	Cyanidation	Tailings Pond
5. QUAZAR II Tunnel	Panganason, Nap- napan, Pantukan	200	Cyanidation	Tailings Pond
6. Rogemias Ragas	Panganason, Nap- napan, Pantukan	100	Cyanidation	Tailings Pond
7. Several Small Scale Mining Operators	Panganason, Nap- napan, Pantukan	500	Amalgamation &Cyanidation	Settling Pond
8. King Eagle Mining	Boringot, Napnapan, Pantukan	-	Cyanidation	Tailings Pond
9. Several Small Scale Mining Operators	Boringot, Napnapan, Pantukan	900	Amalgamation &Cyanidation	Settling Pond
10.Several Small Scale Mining Operators	Gumayan, Kingking, Pantukan	500	Amalgamation	Settling Pond

*With and without permit, expired and on process as of July 28, 2004

Table 7.3. Active Small-Scale Gold Mining Operations in Nabunturan, Compostela Valley, 2004*

Active Small Scale Mining Operators	Location	Estimated No. of Workers	Mode of Recovery & Tailing Disposal	Tailing Disposal
1. UMC	Inupoan, Mainit, Nabunturan	150	Cyanidation	Tailings Pond
2. Delta Mining	Inupoan, Mainit, Nabunturan	50	Amalgamation	Settling Pond
3. Several Small Scale Mining Operators	Inupoan, Mainit, Nabunturan	150	Amalgamation	Settling Pond
4. Several Small Scale Mining Operators	Nuknukan, Bukal, Nabunturan	-	Amalgamation	Settling Pond
5. Several Small Scale Mining Operators	Pagtulian, Bukal, Nabunturan	-	Amalgamation	Settling Pond

*With and without permit, expired and on process as of July 28, 2004

Table 7.4. Active Small-Scale Gold Mining Operations in the Municipalities of Compostela and Maco, Province of Compostela Valley, 2004*

Active Small Scale Mining Operator	Location	Estimated No. of Workers	Mode of Recovery & Tailing Disposal	Tailing Disposal
Candido Balunos	Bango, Ngan, Compostela	200	Cyanidation	Tailings Pond
Several Small Scale Mining Operators	New Barili, Maco	-	Amalgamation	Settling Pond

*With and without permit, expired and on process as of July 28, 2004

SOCIO-ECONOMIC PROFILE

Education

The literacy rate in Davao Region was relatively high at 96.37 % in 2002. (pls. see Table 8). Among the four provinces, Davao del Norte has the highest literacy rate of 98.05, while Davao del Sur has the lowest (93.17%). As the center of education of Davao Region, Davao City has a very high literacy rate of 98.3%.

The table also shows that during the year 2002, the total number of population aged 15 years old and above was 3,342,423, of whom, 121,414 or 3.63% of this age-group were not literate.

Table 8. Literacy Rate Report, Davao Region, CY 2002

Province/City	Number of Population 15 years old and above			Number of Illiterates 15 years old and Above			Literacy Rate (%)	Illiteracy Rate (%)
	Males	Females	Total	Males	Females	Total		
Compostela Valley	280,579	273,403	553,982	8,430	8,150	16,580	97.06	2.94
Davao City	49,397	496,365	990,335	8,465	8,927	17,392	98.30	1.70
Davao del Norte	342,757	335,674	678,431	8,420	8,171	16,591	98.05	1.95
Davao Oriental	20,174	204,459	406,199	11,037	10,486	21,523	94.87	5.13
Davao del Sur	354,229	359,247	713,476	24,290	25,038	49,328	93.17	6.83
Total	1,047,136	1,669,148	3,342,423	60,642	60,772	121,414	96.37	3.63

Source : 28th Annual Report CY 2002, Department of Education Region XI

During school year 2003-2004, Davao Region has a total of 1,742 public and private elementary schools and there were 314 secondary elementary schools. The elementary schools have a transition rate of 96.1% which implies that for every 100 pupils enrolled in Grade Four the previous year, only 96 pupils reach Grade Five the current year. Graduation rate reached a very high percentage of 99.1% which was not achieved in the previous years. About 11.1% of the pupils dropped out from the elementary schools.

A very low survival rate of only 62.9% was reported during school year 2003-2004, which indicates that for every 100 pupils who enrolled in Grade One, about 63 pupils were able to finish the 6th Grade Level. Although the teacher-pupil ratio was 1:38, many elementary schools need teachers due to increase in enrolment. The classroom-pupil ratio was 1:39.

There were 314 public and private secondary schools during school year 2003-2004. The performance indicators of public secondary schools were not as impressive as in the elementary level. The graduation rate consistently declined from 93.6% of school

year 1998-1999 to the lowest rate of 90.3% in school year 2003-2004. Apparently, the drop-out rate reached its peak in 2003-2004 at a very high proportion of 15.1%. Survival rate in public secondary schools was registered at 71.5%.

There are a total of 76 higher education institutions comprising 67 private schools and 9 state universities and colleges (SUCs). Of the 67 private schools, 39 are located in Davao City. Health related courses were offered by 16 schools in 2002-2003. The following school year, four (4) other schools offered health related courses, while only one (1) institution opened a health related course during school year 2004-2005.

Enrollment in health related baccalaureate courses almost doubled in 2003-2004, and increased by 37% in school year 2004-2005. This was attributed to the increase of enrollment in the nursing course. Enrollees in the nursing course swelled to more than 100% in 2003-2004 and increased to only 44.6% in the following school year. Approximately 70% of the total number of graduates in school year 2004-2005 were nursing graduates.

Gross Regional Domestic Product (GRDP)

In 2001, Davao Region's Gross Regional Domestic Product (GRDP) at constant prices has been posted at PhP 61.7 billion. This value has been translated to more than a third (35%) of the Gross Domestic Product in Mindanao and has made the region the highest contributor of the island. Such premier position has long been maintained by the region, being the hub of economic activities in Mindanao.

In 2002, the GRDP of Davao Region plunged to a low PhP 46.8 billion, which decreased its contribution to Mindanao's Gross Domestic Product to only about 25.3%. The decrease was attributed to the transfer of Sarangani, South Cotabato and General Santos City to Region XII through EO 36. Thus, Davao Region ranked second relative to Northern Mindanao as a major contributor of the island's Gross Domestic Product.

In 2003, Davao Region's GRDP registered a slight increase to PhP 48.8 billion, maintaining the 25.3% contribution to the Gross Domestic Product of Mindanao and its second ranking among the six regions of the island. The slight increase of the 2003 GRDP was buoyed by the impressive performance of the service sector which contributed to almost half (41.3%) of the total value.

Meanwhile, the industry sector has contributed almost a third (31%) of Davao Region's GRDP, mainly from the manufacturing industries, construction, mining and quarrying industries. The agriculture, fishery and forestry sector contributed to approximately 27% to the GRDP of Davao Region in 2003.

Labor Force and Employment

In 2004, the total labor force of Davao Region was estimated at 1,785,000 which contributed to more than a fifth (21%) of the total labor force of Mindanao and about 5% of the country's labor force (pls. see Table 9). Of these, a total of 1,629,000 or 91.3% were gainfully employed either in agriculture, industry or services sector. This figure was higher than the national employment rate of 89.1%.

Table 9. Labor Force Statistics, Davao Region, 2004

INDICATOR	Philippines	Mindanao	Region XI
Employment Rate	89.10	92.13	91.3
Unemployment Rate	10.90	7.87	8.7
No. of Employed/Unemployed Persons (in thousands)			
Labor Force	35,619	8,480	1,785
Number of Employed Persons	31,733	7,811	1,629
Number of Unemployed Persons	3,886	669	156
No. of Employed Persons by Industry (in thousands)			
Agriculture	11,785	4,112	721
Industry	4,880	712	189
Services	15,076	2,991	719

Source: 2004 Mindanao Development Statistics

Table 9 also shows that Davao Region's economy is predominantly based on agriculture. A total of 721,000 workers, or almost half (44.3%) of Davao Region's total number of employed persons were involved in agricultural livelihood activities. Only 189,000 were working in the industrial establishments which accounted for about 11.6% of the region's total number of employed work force.

Poverty Incidence

Poverty incidence, i.e. the proportion of families whose annual per capita income fall below annual per capita poverty threshold, similarly provides significant data. Based on the report issued by the National Statistical Coordination Board (NSCB) of Region XI, dated March 29, 2005, Davao Region had maintained its rank as the lowest of the six (6) regions in Mindanao in terms of poverty incidence of families in 2003. The reported poverty incidence of families during that year was 28. 1%, which was 0.4% higher than the revised 2000 level of 27.7%. The annual per capita poverty threshold in 2003 was estimated at PhP11,276 which has increased by 9.9% from the 2000 revised value of PhP10,264.

The region has also maintained the lowest incidence of poor population among all regions in Mindanao. In 2003, the incidence of poor population was 34.4%, which increased by 3.9% from the 2000 data of 33.1%.

The subsistence incidence of families or the proportion of families with per capita income below the per capita food threshold in the region has increased from 12.8% in 2002 to 13.5% in 2003. However, this figure registered as the lowest among all regions in Mindanao. The annual per capita food threshold in Davao Region reached PhP7,751 in 2003, which was 9.4% higher than the revised 2000 level of PhP7,087.

Average Family Income, Expenditures and Savings

Davao Region ranked second highest among the six regions in Mindanao as to the average income of families in 2003. During that year, the average yearly income per family stood at PhP 114,065, which increased by 5.64% from PhP 107,976 in 2000. Apparently, the corresponding family expenses also increased from PhP 90,496 to 97,505. However, the family savings decreased by 5.26% from PhP 17,480 in 2000 to only PhP 16,560 in 2003.

HEALTH STATUS

Life Expectancy

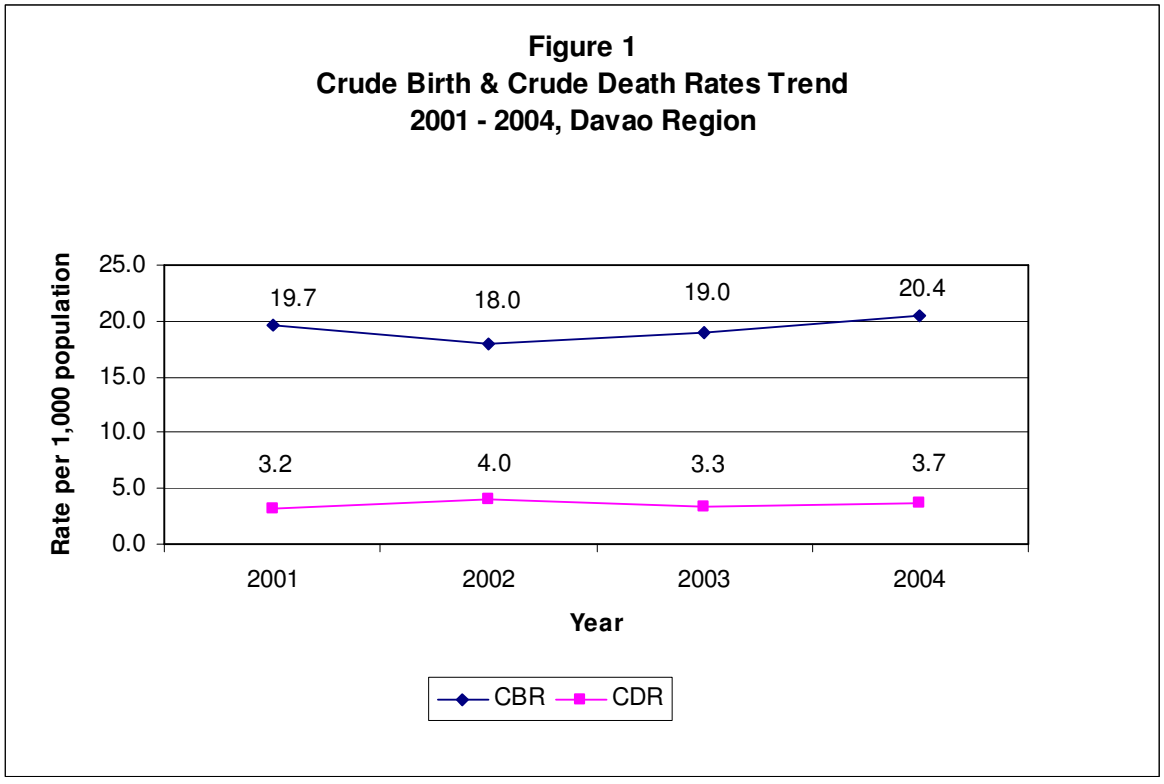
The average life expectancy at birth for both sexes in 2003 was 62.8 years. In 2004, however, it reduced to 61.92 years. The life expectancy for females in 2004 was 64.34 years while a lower figure of only 59.84 was noted among the males.

Crude Birth Rate (CBR) and Crude Death Rate (CDR)

The Crude Birth Rate (CBR) in Davao Region in 2001 was 19.7 (please see figure1). In 2002, it decreased to 18.0 per 1,000 population, but has increased during the next two years. In 2003, an increase of 5.6% to 19.0 per 1,000 population was noted as a result of the intensive campaign launched by the National Statistics Office for birth registration in observance of the child's right to be counted as a Filipino.

In 2004, a 7.4% increase in CBR was observed from 19.0 to 20.4 per 1,000 population. Of the four (4) provinces, Compostela Valley registered the highest CBR of 22.5 per 1,000 population while Davao Oriental has the least with only 18.0 per 1,000 population.

Figure 1. Crude Birth & Death Rates Trend, 2001-2004, Davao Region



Source : Department of Health-Center for Health Development Annual Health Report 2004

Figure 1 also shows that in 2001, the Crude Death Rate (CDR) was 3.2 per 1,000 population. A 25% increase was noted in 2002 from 3.2 to 4.0 per 1,000 population. In 2003, it decreased to 3.3 per 1,000 population. During that year, a marked reduction was observed in Davao del Norte where the CDR reduced from 4.0 to 2.1 per 1,000 population. This was attributed to the intensive retrieval of information on deaths in the hospitals in order to include only the deceased–patients who were residents of the province.

In 2004, the CDR of Davao Region increased by 12.1% from 3.3 to 3.7 per 1,000 population. Among the four provinces of the region, Compostela Valley has the highest CDR of 3.8 per 1,000 population. The CDR in Davao City in 2004 was higher compared to the four provinces of the region which was noted at 5.0 per 1000 population.

A total of 14,930 deaths were reported in 2004. Of these, about 6.62% were infants (0-<1 year old) while 2.31% were children aged 1-4 years. The Swaroop's Index was 62.2% which implies that for every 100 deaths that occurred in the region, 62 were 50 years old and above.

Leading Causes of Mortality

In 2002-2004, cerebrovascular diseases topped the leading causes of mortality, indicating the need to examine closely the lifestyle of the at-risk population in the region.

In 2002, heart diseases ranked second to cerebrovascular diseases. Other leading causes of death among all ages include pneumonia, accidents, malignant neoplasms, tuberculosis, hypertensive diseases, diabetes mellitus, lower respiratory infections and septicemia. In 2003, septicemia and lower respiratory infections were replaced by the diseases of the arteries and of the genitourinary system. The leading causes of mortality were the same in 2003 and 2004, except that diabetes mellitus was replaced by the diseases of the digestive system.

Table 10 shows the leading causes of mortality, number of deaths and rate per 100,000 population as of 2004 and the past 5-year average. It is shown in the table that based on the past five-year average, heart diseases and cerebrovascular diseases were the first and second leading causes of death. However, in 2004, more deaths due to cerebrovascular diseases were registered, resulting in such diseases as the foremost cause of mortality. On the other hand, heart diseases slipped to the fifth rank. The table also shows that the rates of pneumonia, tuberculosis, diseases of the arteries and diseases of the genitourinary system decreased in 2004.

Table 10. Mortality (All Ages) , Leading Causes, Number and Rate per 100,000 Population, 2004 & Past 5-Year Average, Davao Region, Philippines

Causes	2004		Past 5-year Average	
	Number	Rate	Number	Rate
1. Cerebrovascular Diseases	1,897	46.8	1,603	42.5
2. Accidents, all forms	1,477	36.5	1,218	32.3
3. Malignant Neoplasms, all forms	1,432	35.4	1,299	34.5
4. Pneumonia	1,375	34.0	1,585	42.1
5. Heart Diseases*	1,206	29.8	1,811	48.1
6. Tuberculosis, all forms**	786	19.4	1,036	27.5
7. Diseases of the Digestive System***	708	17.5	586	15.6
8. Hypertensive Diseases	706	17.4	579	15.4
9. Diseases of the Arteries, Arterioles and Capillaries	667	16.5	1,073	28.5
10.Diseases of the Genitourinary System****	532	13.1	524	13.9

*Includes ischaemic heart diseases and other heart diseases
**Includes TB respiratory and other TB
***Includes disorders of gallbladder, biliary tract & pancreas and diseases of esophagus, stomach and duodenum
****Includes diseases of the genitourinary system, glomerular and renal tubulo-interstitial diseases, renal failure & kidney diseases

Leading Causes of Morbidity

During the past three years, eight of the ten leading causes of morbidity in Davao Region were communicable but highly preventable diseases. In 2002, the illnesses registered were the upper and lower respiratory tract infections, pneumonia, diarrhea, influenza, tuberculosis, malaria and dengue. The non-communicable leading causes of morbidity were hypertensive diseases and genitourinary system diseases.

In 2003, intestinal parasitism replaced malaria in the ninth rank. In 2004, the ten leading causes of morbidity of Davao Region were similar to those in 2003 except for anemia replacing dengue as one of the leading causes.

Table 11 shows the leading causes of morbidity, the number of cases and rates per 100,000 population in 2004 and in the past 5-year average. Data show that acute upper respiratory diseases were the top leading causes of morbidity in the region, which affected a total of 1,074 people for every 100,000 population in 2004. It is important to note that compared to the past 5-year average, the rate due to upper respiratory diseases decreased by about 50%. Likewise, the rates of almost all diseases reduced except for acute lower respiratory infections which increased from 565 per 100,000 population in the past 5-year average to 589 per 100,000 population in 2004.

Table 11. Morbidity, Leading Causes, Number and Rate per 100,000 Population, 2004 & Past 5-Year Average, Davao Region, Philippines

Causes	2004		Past 5-year Average	
	Number	Rate	Number	Rate
1. AURI*	43,504	1,074	82,994	2,203
2. ALRI**	23,863	589	21,268	565
3. Pneumonia	11,576	286	30,591	812
4. Diarrhea and Gastroenteritis	9,877	244	25,390	674
5. Hypertensive Diseases	6,328	156	11,652	309
6. Influenza	4,454	110	18,762	498
7. Tuberculosis, all forms***	4,307	106	9,791	260
8. Genitourinary System Diseases****	3,840	95	6,146	163
9. Intestinal Parasitism	1,621	40	3,574	95
10. Anemia	1,448	36	1,481	39

Source : RHIS & Special Reports cited in the Department of Health-Center for Health Development Annual Report 2004

*Acute upper respiratory infection, includes acute pharyngitis & tonsillitis

**Acute lower respiratory infection, includes ARI, acute bronchitis

***Includes respiratory TB & other TB

****Includes urinary tract infections, kidney diseases

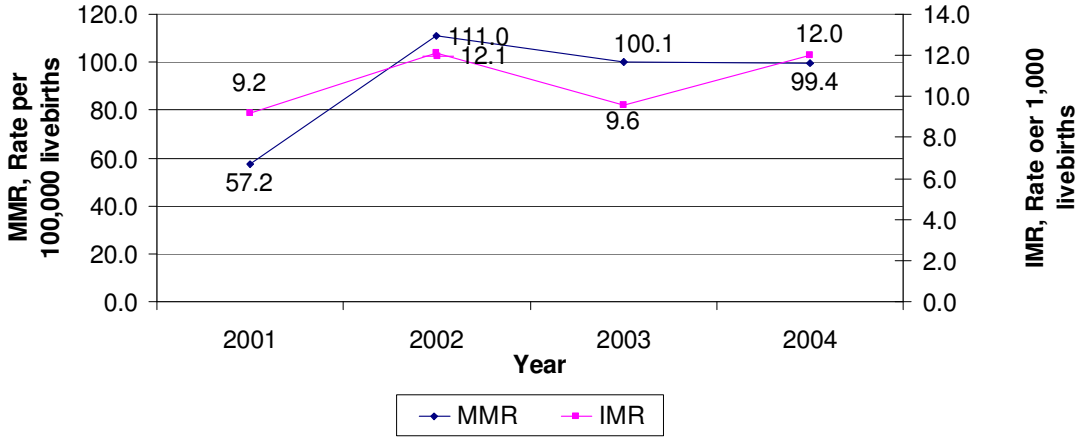
Maternal Mortality

The maternal mortality rate (MMR) of Davao Region in 2001 was 57.2 per 100,000 livebirths and almost doubled to a very high rate of 111.0 per 100,000 livebirths in 2002 (please see figure 2). The marked increase of MMR in 2002 was due to the improved awareness of the personnel on the definition of maternal deaths through the regular conduct of CHD-initiated Maternal Death Reviews (MDR) in all provinces. The increase was not observed in Davao City since the MDR was not conducted in the city during that year.

In 2003, the MMR decreased by 9.8% from 111.0 to 100.1 per 100,000 livebirths, and continued to decline to 99.4 per 100,000 livebirths in 2004. Of the four provinces, Compostela Valley has the highest MMR of 145.0 per 100,000 livebirths while Davao del Sur has the lowest rate of 70.8 per 100,000 livebirths.

The first two leading causes of maternal mortality in Davao Region in 2002-2004 were related to complications of labor and delivery and hypertensive disorders. The former include postpartum hemorrhage, ruptured uterus, placenta retention and uterine atony. Other leading causes of mortality include maternal care related to fetus and amniotic cavity, complications related to puerperium and pregnancy with abortive outcome.

Figure 2
Maternal Mortality & Infant Mortality Trends
2001-2004, Davao Region



Source : Department of Health-Center for Health Development Annual Report 2004

Infant Mortality

Figure 2 also shows the zigzag pattern of the Infant Mortality Rate (IMR) trend of Davao Region from 2001 to 2004. In 2001, the IMR was 9.2 per 1,000 livebirths and increased by 31.5% to 12.1 per 1,000 livebirths in 2002. The increase was observed due to the improvement of the reporting of deaths in Davao Region as a result of the intensive re-orientation of all health personnel on the Regional Health Information System. However, in 2003, the IMR decreased to 9.6 per 1,000 livebirths.

In 2004, the IMR increased again by 25% from 9.6 to 12.0 per 1,000 livebirths. The increase in IMR was observed in the provinces of Davao del Norte, Davao del Sur and in Davao City.

Table 12 reveals that in 2004, Compostela Valley has the highest IMR while Davao del Sur has the lowest rate (15.3 and 6.3 per 1,000 livebirths respectively). It is important to note that the total number of infant deaths in Compostela Valley contributed to about 9% of the total deaths in the province and more than a fifth (22.4%) of the total number of infant deaths of Davao Region.

Table 12. Livebirths, Total Deaths, Maternal Deaths and Infant Deaths, By Province and City, Davao Region, Philippines

Province/City	Projected Population	Livebirths		Total Deaths		Maternal Deaths		Infant Deaths	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Compostela Valley	639,667	14,479	22.6	2,461	3.8	21	145.0	221	15.3
Davao del Norte	811,424	16,150	19.9	2,539	3.1	13	80.5	245	15.2
Davao Oriental	476,113	9,252	19.4	1,399	2.9	10	108.1	92	9.9
Davao del Sur	837,258	16,944	20.2	2,074	2.5	12	70.3	106	6.3
Davao City	1,285,017	25,635	19.9	6,457	5.0	26	101.4	324	12.6

Source: RHIS Report cited in the Department of Health- Center for Health Development Annual Report 2004

Pneumonia and congenital malformations were the first two leading causes of infant mortality in 2003 and in 2004. Other causes of infant mortality in 2003 are similar to those in 2004 except that meningitis replaced malnutrition and other deficiencies as one of the ten leading causes of infant mortality.

Young Child Mortality

A total of 345 children aged 1-4 years old died in 2004, which accounted for about 2.3% of the total deaths of the region and resulting in the young child mortality rate of 85 per 100,000 children.

Pneumonia was the leading cause of death of these children which accounted for about 22% of the total number of deaths of this age-group.

Health Facilities

Public Health Facilities

There are 46 Rural Health Units/Main Health Centers (RHUs/MHCs) providing health services in the municipalities of the region (see Table 13). There are 19 District Health Offices (DHOs), most of which are located in Davao City. The health services in the barangays are provided by the midwives in their respective Barangay Health Stations/Centers (BHSs/BHCs). Of the 1,158 barangays in Davao Region, only 656 (56.6%) have BHSs. This indicates that the population of almost half (43.4%) of the barangays are not regularly visited by midwives.

Table 13. Public Health Facilities, By Province and City, Davao Region, Philippines, 2004

Province/City	Public Health Facilities		
	No. of Rural Health Unit/Main Health Centers	No. of District Health Offices (DHO)	No. of Barangay Health Stations/ Centers
COMPOSTELA VALLEY	11	-	119
DAVAO DEL NORTE	7	-	105
Panabo City	1	-	-
Tagum City	1	-	-
Island Garden City of Samal	-	3	-
DAVAO ORIENTAL	11	-	169
DAVAO DEL SUR	14	-	149
Digos City	1	-	-
DAVAO CITY	-	16	114
DAVAO REGION-TOTAL	46	19	656

Source: PHOs'/CHOs' Reports cited from the Department of Health- Center for Health Development Annual Health Report 2004

Hospitals

Davao Region has a total of 121 hospitals, 24 of which are government while the remaining 97 are private health facilities (Table 14). The hospital-population ratio of Davao Region in 2004 was 1:33,305. Of the four provinces, Davao Oriental has the least number, i.e. only nine (9) government and private hospitals with a hospital-population ratio of 1:52,901. While Davao City is regarded as the administrative center in the region, data however reveal that its population have lesser access to hospital facilities (1:44,311) compared to the residents of Davao del Norte (1:31,209) and Davao del Sur (1:19,471).

Table 14. Number of Hospitals:Government and Private, By Level of Health Care, By Province and City, Davao Region, Philippines, 2004

Province/ City	Number of Hospitals									Ratio to Population
	Primary		Secondary		Tertiary		Total		TOTAL Gov't & Private	
	Gov't	Private	Gov't	Private	Gov't	Private	Gov't	Private		
Compostela Valley	3	5	1	5	0	0	4	10	14	1:45,691
Davao del Norte	2	14	1	5	1	3	4	22	26	1:31,209
Davao Oriental	3	3	1	1	1	0	5	4	9	1:52,901
Davao del Sur	5	30	1	5	1	1	7	36	43	1:19,471
Davao City	3	14	0	6	1	5	4	25	29	1:44,311
Davao Region TOTAL	16	66	4	22	4	9	24	97	121	1:33,205

Source: Department of Health-Center for Health Development Annual Report 2004

Of the 24 government hospitals, 16 are primary and LGU-owned. Two others are tertiary and DOH-retained hospitals, two are tertiary and LGU-owned, while four are secondary and LGU-owned. These hospitals have a total of 1,145 beds.

Of the 97 private hospitals, 9 are tertiary, 22 are secondary and 66 are primary, with a total of 2,951 beds. Most of these hospitals are located in Davao del Sur, Davao City and Davao del Norte. The hospital bed-to-population ratio of Davao Region is 1:989 which is below the standard ratio of 1:500. The lack of hospital facilities is more apparently seen in Compostela Valley and Davao Oriental where the hospital bed-to-population ratios are 1:2,710 and 1:1,882, respectively.

Health Human Resource

There is a shortage of health care providers in Davao Region. This is aggravated by the flight of health professionals to other countries. Table 15 shows that Davao Region did not meet the standard health service provider-population ratio for doctors, dentists, nurses, sanitary inspectors and medical technologists. The inadequacy of government doctors is most severe in Davao del Norte, where one doctor is providing health services to more than 67,000 population compared to the standard ratio of 1:20,000.

Table 15. Number of Selected Health Personnel & Ratio to Population, By Province and City

Health Personnel	Province/City										Total
	Compostela Valley		Davao Oriental		Davao del Norte		Davao del Sur		Davao City		
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	
Doctors	12	1:53,306	12	1:39,676	12	1:67,619	15	1:55,817	20	1:64,251	71
Dentists	12	1:53,306	11	1:43,283	14	1:57,959	14	1:59,804	17	1:75,589	68
Nurses	20	1:31,983	19	1:25,059	32	1:25,357	35	1:23,922	33	1:38,940	139
Midwives	156	1:4,100	173	1: 2,752	176	1: 4,610	207	1: 4,045	82	1:15,671	794
Sanitary Inspectors	16	1:39,979	13	1:36,624	16	1:50,714	28	1:29,902	18	1:71,390	91
Medical Technologists	13	1:49,205	15	1:31,741	15	1:54,095	10	1:83,725	15	1:85,668	68

Source : Department of Health-Center for Health Development Annual Health Report 2004

The midwife to-population ratios in the four provinces have met the standard ratio of 1:5,000. However, in Davao City, about 15,000 people are served by only one midwife, who should have been served by three (3) midwives. Such figures suggest a need to review the number and distribution of midwives particularly in the catchment barangays and in difficult-to-reach areas which are seldom visited by a health care provider or not at all.

Many of the midwives in the Region are contractual workers, who are not prioritized in skills training activities. Some midwives have job contracts from three to six months and are replaced without notice which disrupts the health services provided.

In LGU-owned hospitals, nurses and doctors do not have opportunities to attend clinical skills trainings for lack of health personnel.

PROCESS FOR ARRIVING AT PRIORITIES

The Preparatory Phase

Prior to the data collection activity, an orientation meeting on the health research agenda setting was conducted on September 01, 2005 among the regional coordinators of Regions IX, X, XI, XII/ARMM and Caraga. The meeting was facilitated by Dr. Marlina C. Lacuesta, the Zonal Convenor for Mindanao, Dr. Allan Ferranil, and other representatives of the Philippine Council for Health Research and Development (PCHRD).

Data Collection Procedures

The following recommended strategies were employed to gather data: assessment of health situation through desk review, key informant interview (KII) and roundtable discussion (RTD); assessment of health R&D resources; identification of gaps, problems, and emerging concerns through consultative workshops and identification and validation of priority R&D areas through a consultative workshop. The year-end evaluation meeting among the RHRDC members also served as the venue for validation of the health research agenda.

The Regional Consultation Process

The regional consultative workshop was conducted last October 04, 2005. A total of 50 participants from the academe, government and non-government organizations, and other special groups attended the workshop. The consultation process was facilitated by Mr. Napoleon Amoyen, researcher and faculty of the Ateneo de Davao University, Ms. Nelia Gumela, Nurse V of the Center for Health Development for Southern Mindanao (CHD-SM) and Dr. Annabelle Yumang, MS II, also of the CHD-SM. Dr. Camilo Aurelio Naraval of the Davao Medical Center presented the synthesis of the workshop.

During the workshop, the participants were divided into three groups todiscuss the important health issues concerning the following major topics: a) environment; b) women, children, elderly and special groups; and c) quality of care. The identified health issues were prioritized based on the following proposed criteria:

a) Urgency/magnitude of the issue/problem/prevalence (rank) of the disease/burden to the community
b) Feasibility/doability of the research based on existing capabilities
c) Impact of R&D on a greater number of population (in terms of mortality and morbidity, quality of life, social desirability, cost of health care, and in anticipating future health problems/issues
d) Research has impact on the health issues being addressed
e) Area is not well funded/neglected by other agencies

Group 1 (Environment Group) presented the seven major issues/concerns which were ranked based on the recommended criteria i.e, air quality, water quality, land use planning and conversion, mining, solid wastes, forest management and hazardous chemicals.

Group 2 (Women, Children and Special Groups) identified and ranked five major topics namely: reproductive health, children in need of special protection, older persons, mental health and tuberculosis among women (also among men and children).

Group 3 (Quality Care Group) reported that they identified four major areas of concern for health research and development namely : access to health care, human resources, quality assurance standards and health legislations and policies. These topics were not ranked since these were believed to be equally important and interrelated.

Consultative Meeting with the Regional Health Research and Development Committee (RHRDC) Members

On December 15, 2005, a meeting among the RHRDC members was conducted to evaluate the activities conducted by the RHRDC during the year 2005. The participants also discussed other issues/concerns which were not identified during the regional consultation workshop.

The following issues/concerns were recommended for inclusion in the regional health research agenda:

a) High prevalence of heterophyidiasis
b) Efficacy and safety of widely promoted herbal medicines (e.g. Virgin Coconut Oil and other similar products)
c) High incidence of dengue fever and the efficacy and safety of "tawa-tawa" tea as treatment for dengue fever

HEALTH RESEARCH AND DEVELOPMENT PRIORITIES

This section describes the three main groups of priority areas identified during the regional consultation i.e. environmental health issues; health concerns for vulnerable groups i.e, women, children and older persons; and quality of care. A fourth area - communicable diseases- has been included in the report upon recommendation by the management committee of the Regional Health Research and Development Committee (RHRDC) that heterophyidiasis and dengue fever will be included in the list of health research priorities.

Environmental Health Issues

The environmental health research priorities identified for Davao Region include air and water quality, land use planning and conversion, mining, solid waste management, forest management and hazardous chemicals.

Air Quality

Air pollution is a serious environmental health problem brought about by urbanization and globalization which paved the way for the expansion of large-scale industries and use of modern technology.

Davao City is one of the most polluted urban centers of the country. A study conducted by World Bank revealed that the volume of PM-10 (particulate matter less than 10 microns in aerodynamic diameter) reached 39.8 micrograms per cubic meter which has almost exceeded the 50 micrograms per cubic meter air quality standard. Particulate matter is a mixture of particles which includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by the cement kilns, steel mills, power plants, cars, construction activity, fires and natural windblown dust. Exposure to particulate matter can affect breathing, aggravate existing respiratory and cardiovascular diseases, alter the body's defense immune systems against foreign materials, and damage lung tissues contributing to cancer and premature death.

Air pollutants coming from agribusiness industries have also contributed to the exacerbation of the prevailing environmental problems of Davao City and other areas of the region. Dr. Romeo F. Quijano, professor of the University of the Philippines, stated that the people of Mindanao are worried about the massive use of pesticides. He reported that companies have been using more than 20 chemicals and apply them as cocktail of three or more pesticides, which are even applied aerially. As cited in his report, studies show that only 1-2% of the pesticides applied through aerial spraying reaches the target pest, the rest ends up in the rivers, wells, rainwater tanks for drinking, non-target crops and worst, even to people living within the plantations.

Meanwhile, the Philippine Clean Air Act of 1999 was implemented by the government to protect the quality of air for the health welfare of the population. However, there is unregulated spraying of chemicals in the region as well as lack of mechanisms that monitor the use of chemicals affecting air quality.

Respiratory illnesses are among the many health effects caused by air pollutants. In Davao Region, respiratory infections consistently topped the leading causes of morbidity among all ages. The Center for Health Development in Southern Mindanao reported that in 2002, acute upper and lower respiratory infections were the first and fourth leading causes of morbidity which affected a total of 2,383 persons and 409 persons per 100,000 population respectively. In 2003 and 2004, both diseases were registered as the first and second leading causes of morbidity in the region.

Upon investigation, there is a dearth of research studies on the quality of air and the effects of air pollution. It is therefore recommended that air quality studies be undertaken to address the environmental health concerns particularly in the high-risk areas of Davao Region.

Water Quality

Davao City has the safest water in the world but is continuously threatened with contamination with lead and other toxic metals. Based on the initial results of a six-month water sampling study conducted from February to July, 2002 by the Philippine-Canada Environmental and Economic Management, the lead content of Davao City's main watershed areas, the Talomo and Lipadas rivers, ranged from 0.10 to 0.326 and 0.028 to 0.210 milligram per liter respectively, which were above the 0.01 milliligram per liter allowed by the Philippine National Standard for Drinking Water. The high concentrations of lead endanger the water which drains toward the water table at the Dumoy area in Toril which supplies water to the residents of Davao City.

Studies show that the contamination of the watersheds can be traced to banana and pineapple plantations which are known to be heavy users of petrochemical-based pesticides and fertilizers. The impacts of plantations on people and communities have been in public debate since 2003 and there have been many calls (petition letters) to stop further expansion of plantations in upland watersheds particularly water recharge areas.

While the people are watching closely the existence of agribusiness companies and the consequences of drinking contaminated water with synthetic pesticides, there is also a pressing need to examine the persistence of cases with diarrhea and intestinal parasitism which may be attributed to the lack of safe water supply and environmental sanitation practices of at-risk communities.

The proportion of households with safe water supply in Davao Region has been consistently increasing through the efforts of the Department of Health and the Local Government Units. However, diarrhea continues to persist in the region.

In Davao Region, the proportion of households with access to safe water has increased from 73% from 1998 to about 84% in 2003. In 2004, about 85% of households in the region had access to safe water facilities. During that year, a high proportion of 94% of households in Davao City had access to safe water which has surpassed the national target of only 91%. Among the four provinces, Davao Oriental has the least proportion of households of about 72% with safe water supply. During that year, diarrheal diseases ranked second as the leading cause of morbidity in the province with a rate of 1,830 per 100,000 population.

Based on the annual reports of the Department of Health, diarrhea/gastroenteritis and intestinal parasitism continued to be in the list of top leading causes of morbidity. These health problems are preventable and are highly associated with the use of safe water supply and environmental sanitation practices particularly on the use of sanitary toilets. As to the environmental sanitation issue, the national target for sanitary toilets in 2004 was 85%. However, a very low proportion (75%) of the households in Davao Region were using sanitary toilets. In the highly urbanized Davao City, only 80% were using sanitary toilets. In Davao Oriental, only about 72% were using sanitary toilets. The situation in Compostela Valley was more dismal, where a very low proportion of 68% had sanitary toilets and diarrhea was ranked as the third leading cause of morbidity.

Therefore, with the high prevalence of water-borne diseases and parasitism, it is imperative that more safe water facilities and sanitary toilets be constructed and that the monitoring of environmental health promotion activities must be intensified. It has been recommended that research studies be done to assess the physical, microbiological and chemical quality of water in high risk areas.

Land Use Planning and Conversion

Urbanization and globalization have encouraged the government to open the Philippine economy and resources to foreign investors to enhance economic development. These government actions have led to the expansion of plantations and mining areas, construction of various infrastructure facilities, golf courses and other developmental activities. But these government efforts have brought problems of displacement, declining food security and health problems particularly among women and children.

The indigenous peoples have been targets of exploitation and oppression – a phenomenon that some non-government organizations call “development aggression”. A few of the documented cases of internal displacement experienced by the indigenous peoples of Davao Region are thus provided below :

- Mandaya communities opposing the encroachment of a paper mill, in a 13,668-hectare logging expansion project via IFMA in Cateel town, Davao Oriental
- Direct harassment by a land developer against peasants in Tamugan, Davao City fighting against a crop conversion in their area that is already targeted for land distribution

- Ata-Manobo/Umayamnon tribe communities waging a struggle against a big corporation which later withdrew operations in Kapalong/Agusan boundary
- Some 20,000 families of small-scale miners restive over the encroachment of a gold mining corporation in a 4,000-hectare area in Diwalwal – a gold-rush area in Compostela Valley.
- Moro women in Mandug, Davao City standing helpless with the inundation of their peasant village during floods and heavy downpour due to the construction of a golf course by a developer.

Globalization has also led to the rapid transformation of the agricultural industry from the traditional method of farming which provides various kinds of food in sustainable amounts to a more modern, profitable method of mono-cropping system.

Davao Region's economy is agri-based, but only about 34 % of the total land area are available for agriculture. Some of these are being used for the expansion of plantations which require the use the mono-cropping system. Based on the current data provided by the Bureau of Agricultural Statistics, there are a total of 45 banana plantations located in the region. These have brought tremendous employment opportunities but have equally involved a number of trade-offs, i.e. soil erosion, displacement of indigenous peoples and emergence of diseases associated with the use of pesticides and other toxic substances.

Soil erosion is a serious environmental problem of the country. Based on the field observations of Kenneth Proud, a technical consultant of the European –Union funded Upland Development Programme in Southern Mindanao (UDP-SM), the country loses a huge amount of top soil every year. Compared to the European countries which lose only about one centimeter every 100 years, the Philippines loses about 2-4 centimeters each year. The massive soil loss was said to be the effect of evolution of farming in the country. This started from cutting of trees, to burning and inappropriate farming system. Other factors which led to soil loss were the wrong application of fertilizers, mono-cropping, and non-application of soil and water conservation measures. Of the six provinces of Mindanao monitored for soil erosion by the UDP program, four are located in Davao Region i.e, Compostela Valley, Davao del Norte, Davao Oriental and Davao del Sur.

Approximately 86% of the total land area of Davao Region have already been subjected to various degrees of soil erosion. Of the four provinces and cities of Davao Region, Davao City has the biggest proportion of soil erosion vulnerable area which was estimated at 91.4%. Of the four provinces, Davao Oriental has the widest vulnerable area of about 88.4% while Davao del Norte follows closely at 88.2%. A smaller proportion of 84.8% was observed in the province of Compostela Valley - the site of gold rush areas of the region. Only 76.9% of the total land areas of Davao del Sur have been subjected to soil erosion.

These data suggest that the consequences of land planning and crop conversion have to be addressed, i.e. its impact on people's health. Research studies must be conducted concerning the socio-economic situation of the displaced persons and their health status.

Mining

Mining responds to the demands of the society and produces the minerals needed to satisfy societal needs. Minerals are used in agriculture, transportation, communication, and other needs. In Davao Region, mining industries have provided a 1% contribution to the region's GRDP in the amount of about 2.5 billion in 2003. However, mining has led to severe destruction to the environment and has produced hazardous toxic wastes which are detrimental to the health of the population.

Mercury is one of the most toxic substances used in the mining industry, causing significant damage to the people exposed to it. In a study conducted in Pantukan, Compostela Valley, miners who were using amalgamation method for gold extraction had detectable amounts of blood mercury greater than the allowable limit provided by the WHO. The most significant health effects included poor memory, anosmia and abnormal gait. The study also showed that soil and water samples from the river exceeded the WHO standards.

Currently, the use of mercury has tapered down due to the massive use of cyanide among gold mining industries. As reported by the Bureau of Mines, about 90% of the active small-scale gold mining operating within Region XI have resorted to cyanidation which is more fatal than mercury.

Meanwhile, mercury has been continually released in the environment and is currently absorbed by the at-risk population through water, food, and air.

One of the most serious impacts of the mining industry is the deterioration of health among women and children. Other hazards posed by the mining industry on the women and children include sexual abuse/exploitation and STI infection, lack of food security/access to herbal medicines due to loss of biodiversity, and lack of access to medical services.

An in-depth investigation on the health status of this vulnerable population has yet to be addressed in Davao Region, i.e. to look into the health status of women and children with emphasis on their reproductive health.

Solid Waste Management

Davao Region has been confronted with the problem of providing a comprehensive solid waste management and services to its constituents as mandated by RA 9003 or the Ecological Management Solid Waste Management Act of 2000. The solid waste management law requires local government units to draft and implement a solid waste management plan, which includes garbage collection, segregation, recycling of biodegradable, recyclable, compostable and reusable wastes.

As of November 2005, the solid waste generation for the entire region is estimated at 2000 tons per day based on the population and national average waste generation of 0.4 kg per capita per day for urban and rural areas. The four model local government units (LGUs) (i.e., Davao City, Tagum City, Sto. Tomas and Maragusan) to implement the ecological solid waste management system generated an average of 580 tons of solid wastes per day. This indicates that about 70% of the solid waste in the region comes from other cities and municipalities. With the huge amount of solid wastes generated in the region per day, the timely implementation of the proper solid waste management system is therefore important.

Several activities were conducted by the Department of Environment and Natural Resources (DENR)-Region XI to fully implement the solid waste management law. These consist of:

a) Linkages, networking and coordination within DENR XI and with other LGUs and other groups/agencies
b) Information, education and communication campaign
c) Technical assistance in the conversion of open dump sites into controlled dumpsites and establishment of materials recovery facilities or MRFs
d) Conduct of technical conferences re: violations of IRR of R.A. 9003, specifically on using open dumping as final disposal method of solid wastes; and result of assessment of potential sites for solid waste management facilities.
e) Issuance of notice to proceed to LGUs and private entities
f) Compliance monitoring

To achieve full compliance among the LGUs on RA 9003, DENR XI visited the different LGUs to further increase awareness on the implementation of the solid waste management law. However, based on the report submitted by the monitoring team, only about 53% of the LGUs have been able to comply with the 25% mandatory solid waste diversion.

The following problems in the implementation of RA 9003 were likewise identified :

a) There was lack of coordination among the DENR personnel and the LGUs. This may be due to the fast turn-over of DENR personnel.
b) Some LGUs claim that the prior administration did not consider the implementation of the solid waste management law because of financial set-backs.
c) The LGUs claimed that they were not informed of their responsibilities in the implementation of the law. They focused on the establishment of controlled dump facility (CDF) and not on support systems such as education, segregation, composting and the like that would make their CDF sustainable.

These issues imply that more efforts are needed for waste minimization and proper treatment and disposal of the huge amount of daily wastes in the rural and urban areas of Davao Region. To start off, research studies concerning solid waste management in Davao Region must be done to provide baseline data for the formulation of strategies for effective solid waste management.

Forest Management

Davao Region's forestlands constitute about 60% of the total land area of the region. Of these, only a total of 7,965 hectares comprise the watershed areas, 84.4% of which are located in the gold-rich area of Compostela Valley. In Davao City, there are only 235 hectares of watershed areas. The presence of agribusiness and mining industries has placed these watershed areas in critical condition due to deforestation and pesticide contamination.

Deforestation contributes a lot to soil degradation in the region. The destruction of forests and uplands endangers the watersheds and results to massive soil erosion, declining soil productivity, sedimentation of river channels and siltation of dams, catastrophic floods and acute water shortages during the dry season.

In Davao City, a dangerous rate of depletion of the topsoil on the watershed areas of Davao River has been documented in a study by the University of the Philippines. Findings of the study showed that tremendous degradation of the watershed areas near Davao River was estimated at the rate of 0.15 mm per month or 1.8 mm of topsoil annually.

Deforestation has also led to the loss of the Indigenous Peoples' rights to manage their own resources in order to have access to balanced nutrition and traditional medicines for their ailments. The protection of their rights within their ancestral domain has been guaranteed by the Indigenous Peoples Rights Act (IPRA) of 1997 or RA 8371.

Under the provisions of IPRA, the Indigenous Peoples (IPs) should exercise their rights to develop their land and use the natural resources; maintain a balanced ecology; protect traditional practices including use of herbal medicines; access to biological and genetic resources and bio-genetic resources management systems.

These rights have been half-heartedly provided by the government because of the proliferation of various mining and agribusiness industries. Moreover, there is a problem of delayed approval of the Certificate of Ancestral Domain Titles (CADT). This is probably due to the involvement of different agencies in the whole process of completion of documents by the Indigenous Peoples for CADT application. The issuance of titles is implemented by the National Commission on Indigenous Cultural Communities/ Indigenous Peoples (NCIP). The NCIP reported that currently, only a total of 201,984.78 hectares located in Davao Oriental and Compostela Valley have been issued with CADT. This is less than half (42.4%) of the 476,180.78 hectares which have been processed by the IPs for approval.

Thus, the problem of loss of traditional rights over the forests among the IPs still prevails. There is a need to look into how they manage their resources to have access to the basic necessities like food and traditional medicines.

On the other hand, environmentalists are now racing against time to protect the watershed areas within the region. The DENR Director of Davao Region strongly pushed for the adoption of measures that are required for plantations in securing the Environmental Compliance Certificate or ECC. This requirement is covered under PD 1586 but the implementing rules and regulations exempted the plantations established before 1982 from having the ECC. This implies that the ECC does not guarantee that the watershed areas and forests are fully protected from indiscriminate use of big plantations in the region.

Therefore, there is a need to assess the extent of loss of watershed areas and loss of wildlife in our forests.

Hazardous chemicals

Davao Region and other areas of the country are now facing the challenge of saving the environment and the human population from the consequences brought about by the massive use of hazardous substances which are heavily promoted as effective and safe to use, e.g., pesticides, industrial chemicals and inessential pharmaceuticals.

Dr. Romeo Quijano of the UP College of Medicine reported that chemical companies continue to pour millions of tons of pesticides annually on the world's ecosystems. Among the widely applied pesticides are called "persistent organic pollutants" because these are resistant to physical, biological and chemical degradation. Among these are DDT, endrin, lindane, endosulfan and many other organochlorines which are found in developing countries like the Philippines.

One of the most widely used pesticides is dibromochloropropane (DBCP). This was the cause of birth defects and sterility among men plantation workers that led to a class suit in the Philippines and other banana-producing countries. While DBCP has long been banned in developed countries, it continues to be used in banana plantations in Mindanao. Another banned product, DDT, has been found in vegetables and food products in many countries - the Philippines included.

The threat posed by the massive use of pesticides and other toxic chemicals continues due to the expansion of banana and pineapple plantations. On the other hand, the pressure on the farmers for the mass production of goods such as rice and other crops has also contributed to the massive use of hazardous chemicals.

In Davao Region, a total of 326,536 hectares of land are devoted to rice, corn and sugar plantations which require the use of pesticides. Workers involved in these areas during planting, weeding and harvesting are at-risk of having acute and chronic ill effects such as dizziness, difficulty in breathing, skin and eye ailments, cancers, neurologic effects, reduction in fertility and serious immune and metabolic disorders, and many other diseases.

Specific focus can thus be made on the effects of pesticides that are used in chemical-based farming. There is also a lack of regulated use of pesticides was well as the improper use and application of pesticides by small scale farmers.

Aside from pesticides, other industrial chemicals and toxic chemical by-products industrial companies also contribute to the destruction of the environment. These include the dioxins, furans, ozone depleting chemicals and other persistent organic pollutants that cause cancer, immune system dysfunction, endocrine disruption, reproductive abnormalities, developmental anomalies, degenerative diseases and other ill effects on living organisms.

The irrational use of hazardous pharmaceuticals and medicinal products is also one of the significant concerns that has to be addressed. Currently, the market is flooded with medicinal products in the form of herbal teas, tablets, capsules and decoctions that are promoted to cure all ailments. Efforts must be made to protect the public from the adverse effects of these "wonder drugs" which are often more serious than the ailments these are supposed to cure. These drugs are widely promoted in the market there is no reliable data concerning their safety and efficacy.

Thus, there is a need to assess the effects of these chemicals on humans. Clinical trials concerning the safety and efficacy of herbal medicines should also be conducted.

Health of Women, Children and Special Groups

This section describes the situation and health issues of the vulnerable groups i.e, women, children and older persons. The specific topics identified under this major health issue are reproductive health, children in need of special protection, older persons' concept on the quality of life and their mental health and tuberculosis among women (and men/children).

Reproductive Health

The population is relatively young in Davao Region. As of 2004, about 48.8% of the women and 48.1% of the men were 19 years old and below. The age structure of the region indicates a high proportion of young women who are most likely to experience reproductive health problems and exhibit sexual behaviors that can be detrimental to their health and well-being. During this stage of life, they become vulnerable as they experience some physiological and psycho-emotional changes which are characterized by ambivalence, confusion and insecurity.

Studies show that a significant number of the young population becomes sexually active at a relatively young age. But they have a low level of knowledge and practiced unprotected sex which placed them at a higher risk of unwanted pregnancies, abortion, sexually transmitted infections and other reproductive health problems. The First Young Adult Fertility Studies (FYAFS) in 1982 reported that the age of menarche or the onset of first menstruation among Filipino women was 13.3 years old. The second YAFS done in 1994 noted that about 18% of the youth had premarital sex, the average age of their first sexual experience being 18 years old. About 84% of the youth have heard of at least one method of family planning. Only 4% can be considered knowledgeable about contraception, but these were mostly older, married and highly educated women. Of those who engaged in pre-marital sex, 74% did not use any of the method to prevent pregnancy yet 94% were unwilling and unprepared to become parents.

Currently, the Center for Health Development for Southern Mindanao has intensified its programs that respond to the reproductive health needs of women. However, these initiatives did not fully address the needs of adolescents particularly the indigenous peoples who usually enter into marriage before age 20. A study done among Manobo women showed that about 24% of the women are married at 10-14 years, while 66% got married at age 15-19 years. Mean age at marriage was 15 years.

The Safe Motherhood Project of the Department of Health was aimed to reduce the maternal mortality ratio from 172 deaths/100,000 livebirths to 86/100,000 livebirths. The objective of this program coincides with the fifth goal of the Millennium Development Goal which is to improve the health of mothers through the reduction of maternal mortality ratio from 209 in 1990 to 52 in 2015, and to increase the proportion of births attended by skilled personnel by 75%.

In Davao Region, efforts are now geared towards the improvement of the prenatal and postnatal care services and the reduction of maternal mortality deaths due to complications of labor and delivery through the Access to Emergency Obstetric Care or EmOC.

The family planning services were also intensified. An impressive performance on the monitoring and supervision was noted due to the improvement of monitoring and validation of reports. This resulted to the high drop out rate in the Lactation Amenorrhea Method (LAM) and an increase in the Natural Family Planning (NFP) method.

But the adolescents are still wanting of health services that will address their reproductive health needs. In a recent study conducted in Digos City, it was noted that the adolescents expressed their need for holistic reproductive health services for the youth in their barangays. They revealed that they were aware of the common issues and concerns being confronted by their peers such as substance abuse (smoking, drinking and drug addiction), pre-marital sex, early marriages, abortion, sexually transmitted infections and others. Pre-marital sex was identified as the third most common problem. They were also aware of the reproductive health services provided by the government health facilities. Some of them have availed of the services of the public facilities but complained about the poor accommodation, presence of "palakasan" or favoritism, and inadequacy of supplies and facilities.

Thus, reproductive health remains a top priority research area, aiming specifically on adolescents and indigenous peoples' health concerns – a topic that is seen as seldom-researched, undocumented and gets the least prioritization. The objectives are to determine the practice of the indigenous peoples on fertilityregulation and to identify culturally-appropriate program/project initiatives in indigenous peoples' communities.

Children in Need of Special Protection

Since 1975, the government has enforced the implementation of the Child and Youth Welfare Code or Presidential Decree 603 which requires every parent, school, church and the community in general to promote the welfare of the children and enhance their opportunities in preparation for the responsibilities of adulthood. The care of youthful offenders by the Department of Social Welfare and Development (DSWD), a local rehabilitation center or a detention home in the province or city is included in the provisions of the Child and Youth Welfare Code. A youthful offender is one who is over nine years of age but under twenty years at the commission of the offences.

Since 1978, the Regional Rehabilitation Center for Youth (RRCY) in Davao Region has been serving the children-in-conflict with the law. The RRCY was established initially to serve cases on suspended sentences. Gradually, some court judges referred pending cases to RRCY which was previously opposed by the DSWD. However, the Supreme Court issued an order to transfer all children-in-conflict with the law from the Bureau of Jail Management and Penology to DSWD particularly to the RRCY. All regions strongly opposed the decision due to the lack of preparation in terms of accommodation capacity and personnel requirement.

The RRCY's accommodation capacity is only 80, however, an average of 126 cases were served in the rehabilitation center. During the month of November, 2005, there were 161 referred cases, which further strained the accommodation capacity of the RRCY. More admissions are expected as a consequence of the newly mandated Juvenile Justice Law, which directs the DSWD to manage all detention and suspended cases. For the second semester of 2005-2006, there were a total of 175 cases being served.

The DSWD undertakes a community integration strategy to promote the wholesome growth and development of youthful offenders. This requires the supervision of the social worker, barangay officials and other responsible individuals or groups in the community to ensure that the youthful offenders enjoy the right to live in a society that guarantees them a safe, healthy and good moral environment.

Although community integration has already been implemented in Davao Region, its activities have not been documented nor its effectiveness evaluated.

Older Persons

In Philippine society, older persons are well respected and taken care of by children and by the community. But rapid urbanization has led to the erosion of the status of older persons within the context of the family. Developmental changes of the society have caused family structures to change and the spirit of family solidarity to wane. Parents have less authority over their children and the generation gap has created tensions within the family. The lack of access to quality health care is a common problem among older persons.

The greatest challenge posed by the society today is to provide the rapidly growing older population opportunities to enjoy quality life. But this issue is multi-dimensional in nature.

Based on the UN Declaration of Rights and Responsibilities of Older Persons, the rights of older persons include independence, participation, care, self fulfillment and dignity. Most of the basic needs of the older persons are within the context of independence. These include access to adequate food, water, shelter, clothing and health care; income generating activities, appropriate educational and training programmes, home and environment. Of these requirements, the demand for health care services is the most expensive compared to the other basic needs.

In a study done by Racelis et al. (2003) on the share of health expenditure of the Filipino elderly on the National Health Account, the elderly are "relatively heavy consumers of personal health care (22%), and relatively light consumers of public health care (5%)" (*Source: The Expanded Citizen's Act of 2003*). They are heavy users of care provided by hospitals, non-hospital health facilities and traditional care facilities.

The Senior Citizens Act or Republic Act 7432 was enacted in 1992 to promote the rights of older persons and their participation in nation building. This was issued in response to the UN Declaration of Rights and Responsibilities of Older Persons which will motivate every citizen to care for the older persons so that they will enjoy quality of life.

But what is their concept of quality of life? There has been a dearth of relevant studies about older persons as well as their concept on the quality of life.

It is also noted that there is a lack of awareness on the mental health status among older persons in Davao Region. Research in this area will have to determine the appropriate early intervention for older persons.

Tuberculosis

The incidence of tuberculosis in the country remains as one of the highest in the world, with 75 Filipinos dying daily from the disease. In Davao Region, tuberculosis still remains as one of the top leading causes of illnesses and deaths based on the Regional Health Information System (RHSIS) statistical data on morbidity and mortality from 1990 to 2004. It ranked among the top five in the early 90's and subsequently fell to rank 8th and 6th respectively with the implementation of the passive case finding utilizing the Directly Observed Treatment Short Course Strategy (DOTS) since 1999 up to the present. The DOTS or "Tutok Gamutan" Strategy was funded by the World Health Organization, CIDA-funded World Vision Development Foundation, and the Australian Aid.

With the advent of DOTS, an increasing trend in the case detection rate and cure rate has been observed from 1999 to 2004, however, the rates were still below the performance standards of 77% and 85% respectively. Recently, the Public-Private Mix DOTS strategy was implemented to increase the case detection rate and to ensure a standardized management of TB cases in the public and private sector. As of December, 2004, the Public-Private Mix DOTS Centers which were installed in Davao City and in the three provinces of the region provided TB services to 80% of patients of private doctors.

The unsurpassed performance standards posed a challenge to the health personnel of Davao Region to address the various problems that occurred during the implementation of the DOTS program. In Davao City, the case detection rate dropped from 103% in 1999 to 69% in 2003 which was attributed to the re-shuffling of health personnel in 2001-2002 and the relief of the National Tuberculosis Program (NTP) coordinator in the year 2000 who had been with the program for 15-18 years. Moreover, the case detection rate did not increase significantly since most of the health units practiced passive case finding.

Thus, certain issues have to be addressed to improve the performance of the tuberculosis control program. It has been recommended that a study be conducted on the role and effectiveness of community partners in the prevention of tuberculosis. Such a research will provide further information on the issues reported in a recent study in Davao City which recommends the involvement of both family members and health workers since no significant difference was observed in the effectiveness between these treatment partners.

Quality Care

This section describes the different issues concerning quality care, i.e access to health care, health human resources, quality assurance standards and health legislations and policies.

Access to Health Care

The primary health care (PHC) approach has been considered as one of the major answers to the dismal health situation every developing country is facing. This concept was practiced in the Philippines by various groups in the private sector even before the 1978 Alma Ata Declaration. Accessibility of health services is one of the principles of primary health care approach which aims to deliver health services to all. Among the strategies employed by the practitioners of PHC to make health services accessible to all are by reaching out to the communities where the needy people are, by using indigenous

or resident volunteer health workers as health care providers with a ratio of one community health worker per 10-20 households and by using herbal medicines.

The LGUs of Davao Region have implemented various health programs using practical strategies at the barangay level aimed to improve the capacity of the people to utilize the health services and be responsible for their own health. These include massive IEC campaigns on the prevention and control of communicable and non-communicable diseases, home visitations, community assemblies, health classes and other strategies.

But these efforts did not fully respond to the health needs of the highly vulnerable groups i.e, the youth and the indigenous peoples. As previously mentioned in this report, the youth expressed discontentment on the delivery of health services by the public health facilities.

On the other hand, appropriate and relevant health care services are also elusive to the poorest and marginalized groups of the country, the indigenous peoples. A study done among Manobo women revealed that inaccessibility of the health facility was the most common reason for non-availment of health services. Other reasons included financial constraints (for travel expenses), ashamed with the doctor, and did not know the need of consultation.

Therefore, certain issues have to be addressed concerning access to health care services among these vulnerable groups. Specific topics to be looked into are access to medicines and supplies, health seeking behavior of indigenous peoples, utilization rate of health insurance and barriers and enhancers to effective referral system.

Another research study would be to assess the impact of health education on the incidence of smoking among youths in Davao City. Substance abuse surfaced as the priority issue among the youth in the study done in Digos City.

Health Human Resources

The brain drain phenomenon is a serious problem that threatens the health care delivery system of the country.

In his paper entitled “The Brain Drain Phenomenon and Its Implications to Health”, Dr. Jaime Galvez-Tan, former Secretary of the Department of Health, stated that since 1994, more than 100,000 nurses have already left the country to work in foreign countries and while the ideal nurse to patient ratio is 1:4, the ratio in the country’s government hospitals has increased from 1:50 to 1:100.

But the migration of doctors as nurses is more disturbing given the long training period of doctors, particularly as consultants or specialists. Dr. Tan further reported that at least 9,000 doctors have become nurses or about to become nurses and nursing medics. The shifting to the nursing profession of about 80% of public health physicians will aggravate the worsening state of health care delivery in the country.

Davao Region is also faced with the problem of limited health workers which has been aggravated by the brain drain phenomenon. In Davao City, one doctor serves about 64,000 population. This problem is more severe in Davao del Norte where the doctor-to-population ratio is 1:67,619. Some of these government doctors are either taking up

nursing or are waiting for nursing jobs abroad. In Davao City, one midwife serves about 15,000 population.

Dentists are also becoming scarce. The schools of dentistry in the region are now at the brink of closure due to low enrolment and shifting of their faculty to the nursing course.

With this alarming situation, government efforts should be done to look into the full implementation of the Magna Carta for Health Workers or Republic Act 7305 which mandates a host of benefits, including hazard pay, laundry allowance, subsistence allowance, holiday pay, and even remote-area allowance or medico-legal allowance.

Research studies must therefore be focused on the identification of the contemporary issues and needs of doctors, nurses, midwives and volunteer health workers or on the reasons for migration of health workers such as low pay, fear of malpractice and high workload. The migration patterns of health care workers will also be determined.

Another emerging issue is "involuntary servitude" i.e something which is not supposed to be in one's job description per se. This is illustrated in cases where the barangay health workers do the work of midwives or even doctors, giving out prescriptions or taking care of the therapeutic management of the patients. The prevalence of involuntary servitude among health care workers must be also determined.

Quality assurance standards

When the Local Government Code transferred the responsibility of providing health services to the LGUs, the Department of Health (DOH) remains as the source of technical expertise in the area of health care expressed in its mandate for policy formulation, quality standards development, licensing and regulations and technical assistance provision.

One of the major roles of the DOH is thus to ensure that the health facilities comply with the established standards in the delivery of health care services. To make this possible, the DOH conceptualized the "Sentrong Sigla", the certification component of the former Quality Assurance Program, which is also included as an important part of the Philippine Quality in Health (QIH) Program. The "Sentrong Sigla" Certification (SSC) is a collaborative effort between the DOH and LGUs which requires the former to be the provider of technical and financial assistance packages for health care while the latter are the direct implementers of health programs. The certification process also requires the participation of other government organizations (GOs), non-government organizations (NGOs) and the academe to ensure objectivity in the assessment.

Since the inception of the SSC, a total of 44 RHUs/CHOs and 20 BHSs of Davao Region were SS-certified, using the SS-Phase I quality standards which focused on inputs. In 2002, the certification process was modified into a higher level, the SS-Phase II certification, which covered standards on inputs, systems, process, and outcome compared to only inputs standards A total of 32 local health units were targeted for assessment. Of these, 12 have already been assessed. Based on the revised quality standards, only one health facility did not pass for SS- Phase II certification, notably, the Rural Health Unit of Panabo in Davao del Norte.

Since most of the health facilities have already passed the quality standards for health care delivery either in the first or in the second level of certification, there is a need to compare the utilization of health services between the certified and non-certified facilities.

Finally, there is a related need to assess the cost-efficiency of diagnostic and therapeutic management of the leading causes of mortality and morbidity in the region.

Health Legislations and Policies

The delivery of health services depends on the national appropriation of health subsidy to local health units, among the LGUs funding the local health units in their health services. A specific example of research of this kind is to describe the mechanisms of health budget appropriation in the LGUs, specifically looking into the politics influencing budget appropriation of health care programs in the local level and to describe the legislative support of local chief executives at all levels in health.

There is also a need to determine the factors that affect the utilization rate of health insurance (barriers and enhancers).

Communicable Diseases

This section presents the two health problems which were recommended by the Regional Health Research and Development Committee (RHRDC) to be included in the list of health priorities, i.e. dengue fever and heterophyidiasis.

Dengue Fever

In Davao Region, dengue cases continued to rise despite the various prevention and control strategies conducted by the Center for Health Development to halt the spread of the disease.

In 2002, a series of vector surveillance trainings and larval surveillance activities were done based on Department Order 200-A.s. series 2002, otherwise known as "Barangay to Barangay Puksain: Public Enemy no. 1 DENGUE". These activities and other prevention and control initiatives are given below:

Year 2002

1. Orientation on new barangay officials/key leaders on dengue prevention and control
2. Training of rural sanitary inspectors on dengue vector surveillance
3. Orientation on vector surveillance activity for BHWs and rural health midwives
4. Orientation of government doctors on the revised consensus on dengue management
5. Larval indices established in the four (4) provinces and 1 city of the Region

Year 2003

1. Monthly larval surveillance in 124 barangays in the 10 "hot spots"
2. Training on vector surveillance for sanitary inspectors and medical technologists
3. Training on the Standardization of Laboratory Procedure to Aid Diagnosis of Dengue

Year 2004

1. Continuation of the past year's activities
2. Logistic assistance and larval surveys in selected sites i.e, Toril and Buhangin in Davao City; Banay-banay in the province of Davao Oriental; Babak and Samal Districts in the Island Garden City of Samal; Talaingod and New Corella in Davao del Norte and in Maco, Compostela Province
3. Included the Update on Dengue Management activity on the Training Course on Malaria Treatment Guideline participated by the government physicians of two (2) DOH retained hospitals, district and provincial hospitals

Given the above-mentioned efforts to prevent the further spread of the disease, a sharp decline of number of cases and fatality rates is thus expected. Surprisingly, dengue has persisted in the 10th place of the leading causes of morbidity in Davao Region from 2002 and 2003. Although dengue was replaced by anemia in the 10th rank in 2004, it was observed that the huge number of cases almost reached about 3,000 during that year and the case fatality rates increased consistently during the past three years.

Therefore, there is a need to look into the alarming increase of number of cases of dengue in Davao Region. Research initiatives must be focused in Compostela Valley, Davao del Norte, and Davao Oriental, where the incidence of dengue has increased more than threefold.

On the other hand, a study on the safety and efficacy of the widely promoted "tawa-tawa" tea which is believed to be effective in the management of dengue cases has likewise been recommended.

Heterophyidiasis

Heterophyidiasis is an emerging public health problem in the Philippines, particularly in Davao Region. It is caused by heterophyids, i.e minute flukes that live in the intestines of fish eating hosts. The major species are *Heterophyes heterophyes, Metagonimus yokogawai, Haplorchis taichui*, and *Haplorchis yokogawai*.

The mode of transmission is via ingestion of raw or undercooked freshwater and brackish water fishes with metacercariae. The adult worm inhabits the small intestine of the definitive host, and causes excessive mucus production and sloughing off of the superficial layers of the intestine. The most common clinical manifestations observed among patients in Davao Region were consistent with peptic ulcer disease (PUD) or acid peptic disease (APD) such as upper abdominal discomfort/pain and gurgling abdomen. Colicky abdominal pain and mucoid diarrhea may be present in patients. These signs and symptoms are mild, however, the disease is known to lead to fatal complications since the heterophyids may reach other parts of the body such as the heart, brain and spinal cord.

Initially, the prevalence in the country was considered low. In the 1980s, less than one percent of 30,000 stools examined in nationwide surveys were found positive for heterophyid ova. However, in 1998, a study in Compostela Valley revealed a 31% prevalence rate with the majority of those infected having moderate to heavy intensities of infection. The species was identified to be *Haplorchis taichui*. Since then, the disease has been considered an emerging public health concern in Davao Region.

Reports of positive stool samples were found in other provinces of Davao Region, particularly in areas known to be endemic for schistosomiasis. For instance, in Davao

del Norte, where the prevalence of schistosomiasis has reached about 2.26%, six of the eleven cities/municipalities are endemic for heterophyidiasis. In Carmen, Davao del Norte, 135 heterophyid cases were found with an infection rate of 1.6%.

To date, no policy has been devised to address the emergence of heterophyid cases due to the unavailability of data on the magnitude of the problem in Davao Region. However, the Center for Health Development of Southern Mindanao has urged people to use sanitary toilets instead of throwing their feces in water bodies since heterophyidiasis is common among people living near creeks and rivers.

Thus, there is a need to determine the prevalence rate of heterophyidiasis in Davao Region.

STANDARD MATRIX FOR RESEARCH PRIORITY AREAS/TOPICS

A. Environment

Broad R&D Area	Specific Topic	Rationale	Objective(s)	Responsible Agency	Funding Source
1. Air Quality	Air Quality Studies -Chemical/ Physical Analysis	Unregulated aerial spraying Increasing respiratory/skin infections	To determine air quality in high risk areas in Davao Region	DENR-EMB, LGU, Universities, DOST, NGO's	PCHRD
2. Water Quality	Water Quality in at-risk areas -Microbiological, Chemical/Physical Analysis Spread of water-borne diseases	Prevalence of waterborne diseases and Parasitism (diarrhea, etc.)	To determine water quality in high risk areas in Davao Region	-do- DOH	PCHRD
3. Land Use Planning and Conversion	Impact of (poor) Land use planning and conversion to people's health	Declining food security due to improper conversion of agricultural to residential or commercial areas Economic and social displacement Soil degradation	To determine impact of land use planning and crop conversion to people's health Socio. And economic activities/ status	DENR, LGU, DR, NIA, PCA, DILG, DA, NGO's	PCHRD
4. Mining	Mining-related health problems Environment-related health problems Reproductive health problems in at-risk areas	No in-depth investigation on women& children's health in high risk areas Poor implementation of RA 9262	To investigate reproductive health problems among women & children in high risk areas (mining sites, etc)	DENR-EMB, DOH, DSWD, NGO,s, LGU, Task-Force, Universities	PCHRD
5. Solid Wastes	Solid Waste Management	Lack of facilities for waste disposal and recycling	To determine appropriate solid waste management for Davao Region	DENR-EMB, DOH, LGU, DOST, NGO's	PCHRD

Broad R&D Area	Specific Topic	Rationale	Objective(s)	Responsible Agency	Funding Source
6. Forest Management	Effect of deforestation on the indigenous people's resource management	Declining watershed areas Loss of wildlife/extinction of plants Violation of IP rights on the management of resource within their ancestral domain	To determine extent of watershed areas and loss of wildlife/plants	DENR, LGU, NGO's, NCIP, Universities	PCHRD
7. Hazardous Chemicals	Effects of chemical-based farming	Lack of regulation – use of pesticides Small-scale farmers' improper pesticide application	To determine effects of chemicals to human beings	DA, DOH, LGU, DOST, DENR-EMB, NGO's Universities	PCHRD

B. Women, Children and Special Groups

Broad R&D Area	Specific Topic	Rationale	Objective(s)	Responsible Agency	Funding Source
1. Reproductive Health	Indigenous Health	Seldom researched Undocumented Less Prioritized sector	To determine IP practice on FP or fertility regulation To identify culturally-appropriate program/ Project initiatives in the IP communities	NCIP DOH NGO's DSWD	PCHRD Ford Founda-tion
2. Children in Need of Special Protection	Community integration of rehabilitated children	Undocumented Focused only on rehabilitation	To determine effectiveness of pre-community integration processes by the rehabilitating agencies	DSWD	PCHRD UNICEF
3. Older Persons	Quality of life concept of older persons	Less focused Lack of information	To determine the concept of "quality of life" among the older persons	DSWD NGO's	PCHRD
4. Mental Health	Mental Health among older persons	Lack of awareness on the mental health status of the older persons	To recognize the mental health status of older persons To determine appropriate early intervention for OP's	DSWD NGO's Coalition of services for the elderly	PCHRD
5. TB among Women (children and men)	Community partners in TB prevention	No assessment on the role of the community partners in tuberculosis prevention	To determine effectiveness of community partners in tuberculosis prevention	DOH and other stakeholders	PCHRD

C. Quality Care

Broad R&D Area	Specific Topic	Rationale	Objective(s)	Responsible Agency	Funding Source
1. Access to Health Care	Access of vulnerable groups to health care (youth, IP's) Access to medicines and supplies	Vulnerability to certain health problems is particularly high among certain groups	To assess the impact of health education on the incidence of smoking among youths in Davao City	LGU	
			To describe factors affecting the health seeking behavior of IP's (Manobos, Bagobos) To identify barriers and enchancers to effective referral system		
2. Health Legislations and Policies	Interaction of LGUs and health care unit (esp. Sentrong Sigla)	Delivery of health services is dependent on rational appropriation of health subsidy	To determine the utilization rate of health insurance among … To identify barriers and enhancers in health insurance utilization To describe mechanisms of health budget appropriation in the LGUs To describe the legislative support of local chief executives (all levels) in health	PHIC PHIC LGU LGU	

Broad R&D Area	Specific Topic	Rationale	Objective(s)	Responsible Agency	Funding Source
3. Human Resources	Remuneration of health care workers Medical malpractice Migration patterns of health care personnel Involuntary servitude Career tracking	Reasons for migration of health workers due to low income, high workload and fear of malpractice	To identify contemporary career issues and needs of doctors, nurses, midwives and volunteer health workers To determine prevalence of proportion of involuntary servitude among health care workers	Civil Service Commission DOLE	
4. Quality Assurance Standards	Cost-efficiency of diagnostic and therapeutic management Health education Sentrong Sigla	There is a need to regulate the standards for the delivery of health services to decrease morbidity and mortality and increase cost-effectiveness of health care	To compare utilization of health services between Sentrong Sigla and non-Sentrong Sigla certified facilities To assess cost –efficiency of diagnostic and therapeutic management of top ten causes of mortality and morbidity	DOH	

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