Contents

1.	Introduction				
		Structure of the report Themes of the report	3		
Part	: I T	he problem of overweight and obesity	5		
2.	Defining the problem				
	2.1	Introduction	6		
	2.2	Why classify overweight and obesity?	7		
	2.3	Body mass index	8		
		2.3.1 Use of other cut-off points in the classification of obesity2.3.2 Variation in the relationship between BMI and body	8		
		fatness	8		
		2.3.3 Use of BMI to classify obesity	9		
	2.4	Waist circumference and waist: hip ratio	9		
	2.5	Additional tools for the assessment of obesity	11 11		
	2.6	Classifying obesity in childhood	11		
		2.6.1 Use of growth charts2.6.2 International childhood reference population	12		
		2.6.3 BMI-for-age reference curves	12		
	Refe	References			
3.		pal prevalence and secular trends in obesity	16		
	3.1	Introduction	16		
		A note of caution	17		
		The WHO MONICA project	17 20		
	3.4	African Region	20		
		3.4.1 Secular trends in obesity3.4.2 Current prevalence of obesity	21		
	3.5	Region of the Americas	21		
	0.0	3.5.1 Secular trends in obesity	21		
		3.5.2 Current prevalence of obesity	22		
	3.6	South-East Asia Region	23		
		3.6.1 Secular trends in obesity	23		
		3.6.2 Current prevalence of obesity	24		
	3.7	European Region	24		
		3.7.1 Secular trends in obesity	24		
		3.7.2 Current prevalence of obesity	24		
	3.8	Eastern Mediterranean Region	25		
		3.8.1 Secular trends in obesity	25		
		3.8.2 Current prevalence of obesity	26		
	3.9	Western Pacific Region	27		
		3.9.1 Secular trends in obesity	27		
		3.9.2 Current prevalence of obesity	29		
		Body mass index distribution in adult populations	30 31		
	3.11 Obesity during childhood and adolescence				
	Refe	erences	34		

Part II Establishing the true costs of the problem of overweight and obesity			38			
		and obsolity	00			
4.		Health consequences of overweight and obesity in adults				
		and children				
	4.1	Introduction	39			
	4.2	,	40			
	4.3	9	40			
	4.4 4.5	,	42			
	4.6	Intra-abdominal (central) fat accumulation and increased risk Obesity-related mortality	43			
	4.7		44 46			
	7.7	4.7.1 Cardiovascular disease and hypertension	46			
		4.7.2 Cancer	48			
		4.7.3 Diabetes mellitus	49			
		4.7.4 Gallbladder disease	50			
	4.8	Endocrine and metabolic disturbances associated with obesity	51			
		4.8.1 Endocrine disturbances	51			
		4.8.2 Metabolic disturbances	53			
	4.9		54			
		4.9.1 Osteoarthritis and gout	54			
		4.9.2 Pulmonary diseases	55			
	4.10	Psychological problems associated with obesity	55			
		4.10.1 Social bias, prejudice and discrimination	56			
		4.10.2 Psychological effects	57			
		4.10.3 Body shape dissatisfaction	57			
		4.10.4 Eating disorders	57			
	4.1	Health consequences of overweight and obesity in childhood				
		and adolescence	58			
		4.11.1 Prevalence	58			
		4.11.2 Psychosocial effects	59			
		4.11.3 Cardiovascular risk factors	59			
		4.11.4 Hepatic and gastric complications	59			
		4.11.5 Orthopaedic complications	60			
	Dof	4.11.6 Other complications of childhood obesity	60			
	Rei	erences	60			
5.	Hea	alth benefits and risks of weight loss	69			
	5.1	Introduction	69			
	5.2	Problems in evaluating the effects of long-term weight loss	69			
	5.3	Weight loss and general health	70			
		5.3.1 Modest weight loss	70			
		5.3.2 Extensive weight loss	70			
	5.4	Weight loss and mortality	70			
	5.5	Impact of weight loss on chronic disease, and on endocrine				
		and metabolic disturbances	71			
		5.5.1 Cardiovascular disease and hypertension	71			
		5.5.2 Diabetes mellitus and insulin resistance	71			
		5.5.3 Dyslipidaemia	72			
	F.C	5.5.4 Ovarian function Weight loss and payabassis! functioning	72			
	5.6 5.7	Weight loss and psychosocial functioning Hazards of weight loss	72 73			
	0.1	HAZAHAS OF WEIGHT 1035	1,3			

	5.8 Weight cycling5.9 Effects of weight loss in obese children and adolescentsReferences				
	нете	erences	75		
6.	Economic costs of overweight and obesity				
	6.1	.1 Introduction			
	6.2	Cost-of-illness studies	79		
		6.2.1 Uses of cost-of-illness studies	80		
		6.2.2 Limitations of cost-of-illness studies	80		
		6.2.3 Steps in undertaking a cost-of-illness study	81		
		6.2.4 The disability-adjusted life year	83		
	6.3	International estimates of the cost of obesity	83		
		6.3.1 Studies in developed countries	83		
		6.3.2 Studies on the broader economic issues	86		
		6.3.3 Studies in developing countries	88		
		6.3.4 Conclusions	88		
	6.4	Economic costs and benefits of obesity treatment	89		
		6.4.1 Analyses of obesity-control trials	89		
		6.4.2 Potential cost savings associated with a reduction in the			
		prevalence of obesity	90		
		6.4.3 Cost-effectiveness of obesity prevention and treatment	91		
	Refe	erences	97		
Part	Ш	Understanding how overweight and obesity develop	100		
ı uıt		oridorotaliding new everweight and escenty develop	, 00		
7.	Factors influencing the development of overweight and obesity				
	7.1	Introduction	101		
	7.2	Energy balance and the physiological regulation of body weight	102		
		7.2.1 Fundamental principles of energy balance	102		
		7.2.2 Physiological regulation of body weight	105		
		7.2.3 Dynamics of weight gain	105		
		7.2.4 Implications for public health	107		
	7.3	Dietary factors and physical activity patterns	108		
		7.3.1 Dietary factors	108		
		7.3.2 Physical activity patterns	112		
	7.4	Environmental and societal influences	118		
		7.4.1 Changing societal structures	118		
		7.4.2 Variation within societies	124		
		7.4.3 Cultural influences	126		
		7.4.4 Impact of societal changes on food intake and activity	400		
		patterns	129		
	7.5	Individual/biological susceptibility	133		
		7.5.1 Genetic susceptibility	134		
		7.5.2 Non-genetic biological susceptibility	137		
		7.5.3 Other factors promoting weight gain	139		
	7.6	Weight loss	142		
	Refe	erences	142		
Part	IV	Addressing the problem of overweight and obesity	153		
8.	Drin	ciples of prevention and management of overweight and obesity	154		
0.		Introduction	154		

	8.2		egies for addressing the problem of overweight			
			obesity	156		
	8.3		ention strategies	156		
		8.3.1	Effectiveness	157		
		8.3.2	Aims	158		
		8.3.3	Levels of preventive action	160		
		8.3.4	Integrating obesity prevention into efforts to prevent			
			other noncommunicable diseases	162		
	8.4	Deali	ng with individuals with existing overweight and obesity	163		
		8.4.1	The current situation	164		
		8.4.2	Knowledge and attitudes of health professionals	164		
		8.4.3	Improving the situation	166		
	8.5	Partn	erships for action on obesity	167		
		8.5.1	Shared responsibility	167		
		8.5.2	Coordination of government policies	170		
	Refe	erence	S	170		
9.	Prov	ention	and management of overweight and obesity in			
Ο.			s: a public health approach	174		
	9.1		luction	174		
	9.2		rening at the population level	175		
		9.2.1	Relationship between average population BMI and the	170		
		0.00	level of obesity	176		
		9.2.2	Optimum population BMIs	178		
		9.2.3	Will population-based approaches to preventing weight			
			gain lead to increased levels of underweight and eating			
			disorders?	179		
	9.3		c health intervention strategies	179		
		9.3.1	Improving the knowledge and skills of the community	179		
		9.3.2	Reducing population exposure to an obesity-promoting			
			environment	180		
	9.4	Priorit	y interventions	180		
		9.4.1	Increasing physical activity	181		
		9.4.2	Improving the quality of the diet	181		
		9.4.3	Measures for use in evaluating obesity-prevention			
			programmes	182		
	9.5	Results of public health programmes for the control of				
		obesi	ty	183		
		9.5.1	Countrywide public health programmes	184		
		9.5.2	Communitywide CHD prevention programmes	184		
		9.5.3	Programmes targeting factors important in the			
		0.0.0	development of obesity	187		
		9.5.4	Implications for future public health programmes to	107		
		0.0.1	control obesity	189		
	9.6	Lesso	ons to be learned from successful public health	100		
	5.0	camp	The state of the s	190		
	9.7		c health strategies to improve the prevention and	190		
	3.1		gement of obesity	190		
		9.7.1	Developed countries	190		
	Dof	9.7.2	, ,	192		
	Hele	erences		194		

	Prevention and management of overweight and obesity in at-risk individuals: an integrated health-care services approach in				
			settings	197	
		Introdu		197	
			gement strategies for at-risk individuals and groups	198	
			Prevention of weight gain	198	
		10.2.2	Weight maintenance	200	
			Management of obesity comorbidities	200	
		10.2.4	Weight loss	201	
	10.3	A health-care services approach to the new concept of			
		weight	t management	203	
			Recruitment and referral	203	
			Comprehensive health assessment	204	
			Setting appropriate targets	205	
		10.3.4	Selection and implementation of appropriate		
			management strategies	206	
			Monitoring, rewards and evaluation	208	
	10.4		t support in obesity treatment	208	
			Support within the health-care service	209	
			Involvement of family	209	
			Self-help and support groups	210	
			Commercial weight-loss organizations	210	
	10.5		nent of obesity	211 211	
			Dietary management	213	
			Physical activity and exercise	215	
			Behaviour modification	217	
			Drug treatment	221	
			Gastric surgery Traditional medicine	223	
			Other treatments	223	
	10.6		gement of obesity in childhood and adolescence	224	
	10.0		Evidence that treatment of childhood obesity prevents	221	
		10.0.1	later adult obesity	224	
		1062	Treatment of overweight and obese children	226	
			Obesity-management programmes for children	228	
	Refe	rences		231	
	11010	1011000	,		
Part	V (Challen	iges for the new millennium	239	
11.	Con	clusion	s and recommendations	240	
	11.1	Gener	ral conclusions	240	
	11.2	Recor	nmendations	241	
		11.2.1	Defining the problem of overweight and obesity	241	
		11.2.2	Establishing the true costs of the problem of		
			overweight and obesity	243	
		11.2.3	Understanding how the problem of overweight and		
			obesity develops	245	
		11.2.4	Addressing the problem of overweight and obesity	247	
Ackr	nowle	dgeme	ents	251	
Ann					
Crite	eria fo	or eval	uating commercial institutions involved in weight loss	253	