

ORAL CANCER PREVENTION

VOLUME 19

This publication represents the views and expert opinions of an IARC Working Group on the Evaluation of Cancer-Preventive Interventions, which met remotely, 4–11 December 2021

LYON, FRANCE - 2023

IARC HANDBOOKS OF
CANCER PREVENTION

CONTENTS

NOTE TO THE READER	1
LIST OF PARTICIPANTS	3
PREAMBLE – PRIMARY PREVENTION	7
A. GENERAL PRINCIPLES AND PROCEDURES	7
1. Background.....	7
2. Objectives, scope, and definitions.....	8
3. Identification and selection of interventions and outcomes for review	10
4. The Working Group and other meeting participants.....	12
5. Development of a volume of the <i>IARC Handbooks</i>	14
6. Overview of the scientific review and evaluation process	15
7. Responsibilities of the Working Group.....	17
B. SCIENTIFIC REVIEW AND EVALUATION	18
1. Intervention and outcome characterization	19
2. Studies of cancer prevention in humans	21
3. Studies of cancer prevention in experimental animals.....	28
4. Mechanistic evidence and other relevant biological data	30
5. Summary of data reported.....	31
6. Evaluation and rationale.....	32
References.....	37
PREAMBLE – SECONDARY PREVENTION	41
A. GENERAL PRINCIPLES AND PROCEDURES	41
1. Background.....	41
2. Objectives, scope, and definitions.....	42
3. Identification and selection of interventions and outcomes for review	44
4. The Working Group and other meeting participants.....	45
5. Development of a volume of the <i>IARC Handbooks</i>	48
6. Overview of the scientific review and evaluation process	49
7. Responsibilities of the Working Group.....	51
B. SCIENTIFIC REVIEW AND EVALUATION	52
1. Definitions.....	52
2. Characterization of the disease	54
3. Screening methods.....	54

4. Current global screening practices	55
5. Epidemiological studies of each screening method	55
6. Summary of data reported	66
7. Evaluation and rationale	66
References	69
GENERAL REMARKS	71
LIST OF ABBREVIATIONS	75
1. ORAL CANCER AND ORAL POTENTIALLY MALIGNANT DISORDERS	77
1.1 Anatomy of the oral cavity and the oropharynx	77
1.1.1 Anatomy of the oral cavity	77
1.1.2 Anatomy of the oropharynx and the soft palate	80
1.2 Global burden of oral cancer, oropharyngeal cancer, and oral potentially malignant disorders	81
1.2.1 Oral cancer and oropharyngeal cancer	81
1.2.2 Oral potentially malignant disorders	88
1.3 Oral neoplasia	88
1.3.1 Classification and natural history of OPMDs and oral cancer	88
1.3.2 Stage at diagnosis and stage-related survival	94
1.3.3 Treatment and management of OPMDs and oral cancer	99
References	101
2. REDUCING INCIDENCE OF CANCER OR PRECANCER	105
2.1 Established risk factors	105
2.1.1 Tobacco smoking	105
2.1.2 Alcohol consumption	107
2.1.3 Smokeless tobacco use	108
2.1.4 Chewing areca nut products (including betel quid) with added tobacco	109
2.1.5 Chewing areca nut products (including betel quid) without tobacco	110
2.1.6 HPV16 infection	111
2.1.7 Combined effects of established risk factors	112
2.2 Additional potential risk factors for oral cancer	114
2.2.1 Environmental factors	114
2.2.2 Lifestyle factors	115
2.2.3 Demographic factors	116
2.2.4 Oro-dental factors	116
2.2.5 Systemic factors	117
2.2.6 Familial or genetic predisposition	118
2.3 Impact upon quitting	119
2.3.1 Tobacco smoking	119
2.3.2 Alcohol consumption	138
2.3.3 Smokeless tobacco use	150
2.3.4 Chewing areca nut products (including betel quid) with added tobacco	158
2.3.5 Chewing areca nut products (including betel quid) without tobacco	169
2.3.6 HPV16 infection	185

2.4 Preventive dietary agents.	191
2.4.1 Preventive dietary agents for the development of oral cancer.	191
2.4.2 Preventive dietary agents for the development or progression of OPMDs	193
References.	194
3. CESSATION OF SMOKELESS TOBACCO AND/OR ARECA NUT USE.	209
3.1 Product definition and description	209
3.2 Prevalence of consumption.	214
3.2.1 WHO South-East Asia Region.	214
3.2.2 WHO Western Pacific Region	219
3.2.3 WHO European Region	220
3.2.4 WHO Region of the Americas	226
3.2.5 WHO African Region.	228
3.2.6 WHO Eastern Mediterranean Region	229
3.2.7 Determinants of use	230
3.3 Interventions for cessation of use.	242
3.3.1 Behavioural interventions	242
3.3.2 Pharmacological interventions.	250
3.3.3 Combined pharmacological and behavioural interventions.	253
3.4 Policies and their impacts	264
3.4.1 Control policies for smokeless tobacco	264
3.4.2 Control policies for areca nut products (including betel quid)	280
References.	282
4. SCREENING AND EARLY DIAGNOSIS OF ORAL CANCER.	295
4.1 Screening methods and technologies.	295
4.1.1 Clinical oral examination.	295
4.1.2 Mouth self-examination	298
4.1.3 Adjunctive techniques	299
4.1.4 Cytology and quantitative DNA cytometry	306
4.1.5 Liquid biopsy	308
4.1.6 Use of emerging technologies in the primary screening setting	310
4.2 Organized and opportunistic oral cancer screening activities.	313
4.3 Determinants of participation in screening for oral cancer	314
4.3.1 Individual level	316
4.3.2 Health-care provider level	316
4.3.3 Health-care system level	317
4.3.4 Health-care policies	317
4.3.5 Strategies to increase participation in oral cancer screening	317
4.4 Effectiveness of screening.	317
4.4.1 Preventive effects of screening.	317
4.4.2 Harms of screening	323
4.5 Risk-based model for screening	324
References.	325

5. SUMMARY	337
5.1 Oral cancer and oral potentially malignant disorders	337
5.1.1 Anatomy of the oral cavity and the oropharynx	337
5.1.2 Global burden	337
5.1.3 Oral neoplasia	338
5.2 Reducing incidence of cancer or precancer	339
5.2.1 Established risk factors	339
5.2.2 Impact upon quitting	340
5.2.3 Preventive dietary agents	343
5.3 Cessation of smokeless tobacco and/or areca nut use	343
5.3.1 Product definition and description	343
5.3.2 Prevalence of consumption	344
5.3.3 Interventions for cessation of use	346
5.3.4 Policies and their impacts	347
5.4 Screening and early diagnosis of oral cancer	348
5.4.1 Screening methods and technologies	348
5.4.2 Organized and opportunistic oral cancer screening	350
5.4.3 Determinants of participation in screening for oral cancer	350
5.4.4 Effectiveness of screening	350
5.4.5 Risk-based model for screening	351
6. EVALUATIONS, STATEMENTS, AND CONSIDERATIONS	353
6.1 Impact of quitting exposure to a risk factor on incidence of or mortality from oral cancer	353
6.1.1 Tobacco smoking	353
6.1.2 Alcohol consumption	353
6.1.3 Smokeless tobacco use	354
6.1.4 Chewing areca nut products (including betel quid) with or without tobacco	354
6.1.5 HPV16 infection	355
6.2 Interventions for cessation of smokeless tobacco or areca nut use	355
6.2.1 Behavioural interventions in adults	355
6.2.2 Behavioural interventions in youth	356
6.2.3 Pharmacological interventions	356
6.2.4 Combined pharmacological and behavioural interventions	356
6.2.5 Policies	357
6.3 Screening for oral cancer and OPMDs	357
6.3.1 Effectiveness of screening by clinical oral examination	357
6.3.2 Additional considerations	358