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摘要

檳榔國際研討會(2016 International Conference on Betel Quid and Areca Nut)業於105年4月27日於馬來西亞吉隆坡召開，本次是由美國國家衛生總署(National Institute of Health; NIH)轄下的癌症研究所(National Cancer Institute)主辦、本署跟馬來亞大學共同協辦，內容相當豐富，共有4場主題會議，內容包括：「檳榔的致病機轉與流行病學」、「檳榔危害的預防、檳榔成癮與依賴」、「口腔癌篩檢與早期診斷」、「檳榔危害防制策略與經濟政策」，及4場平行會議：「嚼檳率調查」、「檳榔成癮與依賴之探討」、「如何進行篩檢與早期偵測之研究—對低資源國家之建議」與「檳榔的販售規範與稅務政策」。本署邱淑媿署長代表國民健康署擔分別於4月28日上午舉辦的「口腔癌篩檢與早期診斷」場次下午舉辦的平行論壇—「如何於低資源國家發展口腔癌篩檢政策」之場次演講並主持論壇，與來自亞太地區之200業務主管部門主管、國際組織顧問及專家學者，分享我國口腔癌症防治政策與成果。

本署邱淑媿署長與各國與會者分享之臺灣癌症防治經驗包括：口腔癌的流行病學現況、嚼檳榔與口腔癌之相關性、癌症防治實施現況、癌症登記及目標訂定等。我國口腔癌症防治計畫不僅被專家學者肯定及認同，而我國推動的口腔癌篩檢是具實證基礎，且可以發現早期口腔癌個案，有效降低疾病的威脅為也廣受推崇。邱署長也與會議中與美國國家癌症研究中心主任—Dr. Tremble、世界衛生組織整合中心主任—Saman Warnakulasuriya、世界衛生組織癌症研究所主任Dr. Kurt Straif、馬來亞大學口腔癌整合研究中心主任—Rosnah Binti Mohd Zain進行意見交流，一同為亞洲口腔癌癌症防治擘劃未來藍圖。未來，國民健康署將持續與國際接軌，進行跨國交流與學術研究，並以實質參與方式，繼續為提升臺灣的國際能見度來努力。

本次論壇決定將著手準備於世界衛生大會提案，要求各國政府提出檳榔及口腔癌防治相關的有效行動，並研議仿照FCTC研擬檳榔危害防制之國際公約。

壹、2016 International Conference on Betel Quid and Areca Nut 簡介

國際癌症研究署 (International Agency for Research on Cancer) 於2004年出版「IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Vol.85」專刊指出，檳榔及檳榔子為第一類致癌物，可對人類導致口腔癌、食道癌、咽癌、喉癌。

嚼檳榔是導致口腔癌重要原因，而檳榔又盛行於亞熱帶國家，因此檳榔為東南亞國家重要健康問題，為協力解決檳榔所造成之健康問題，美國國家衛生研究院於105年4月27日至28日於馬來西亞吉隆坡舉行「檳榔防制國際研討會(The International Conference on Betel Quid and Areca Nut)」，研討以下主要議題：(1)研訂檳榔防制相關研究的優先順序；(2)發展具實證研究基礎的檳榔防制相關策略；(3)分享檳榔相關研究之成果；(4)建立檳榔研究網絡；(5)培訓中低收入國家的研究人才(大會議程表詳如附件一)。本次論壇主要與會人員為：美國國家癌症研究中心國際合作主任Edward Trimble、世界衛生組織整合中心主任Saman Warnakulasuriya、世界衛生組織癌症研究所主任Dr. Kurt Straif、馬來西亞衛生部總司長Noor Hisham Abdullah、馬來亞大學口腔癌整合研究中心主任Rosnah Binti Mohd Zain、印度細胞學及癌症預防組織主任Dr. Ravi Mehrotra、馬來西亞衛生部口腔衛生司長Dr. Noor Aliyah bt Ismail，及來自亞太地區業務主管部門主管、國際組織顧問及專家學者等，約200人參加(與會人員名單如附件二)。

貳、目的

我國近年來積極參與國際相關研討會及會議，成功將我國重要公共衛生政策與各國分享，並建立良好公共衛生人脈及國際形象。本研討會主辦單位美國國家衛生總署 (National Institute of Health; NIH) 轄下癌症研究所的主任Trimble過去多次與本署邱淑媿署長在國際研討會場合交流，了解我國口腔癌防

治為亞洲各國最為卓越者，相關政策與經驗非常值得與飽受檳榔危害問題所擾的東南亞國家分享，故前於規劃會議時即諮詢本署相關意見與作為，且邀請本署擔任本次會議的共同協辦者。此次大會共邀請東南亞及西太平洋等逾30個國家官員與學者參與，探討之議題包括：「找出檳榔防制相關研究的優先順序」、「找出具實證研究的檳榔防制相關策略」、「分享檳榔相關研究之發現」、「建立檳榔研究網絡」、「強化中低收入國家的研究人才」、「發展各式檳榔防制方法(如E-health或M-health)」等，並透過分享口腔癌防制的經驗及策略與學術交流等管道建立合作夥伴關係；邱淑媿署長代表國民健康署署長身份蒞會演說，分享我國口腔癌症防制政策與成果。此會議將有效提升台灣癌症防治能力之能見度，並對國際進行交流實有助益。

參、會議過程

一、2016 International Conference on Betel Quid and Areca Nut

本次會議於4月27日至28日在馬來西亞吉隆坡召開，整個會議的行程安排相當緊湊，內容也相當豐富，共有4場主題會議，分別是：「檳榔的致病機轉與流行病學」、「檳榔危害的預防、檳榔成癮與依賴」、「口腔癌篩檢與早期診斷」、「檳榔危害防制策略與經濟政策」，及4場平行會議：「嚼檳率調查」、「檳榔成癮與依賴之探討」、「如何進行篩檢與早期偵測之研究—對低資源國家之建議」與「檳榔的販售規範與稅務政策」。

4月27日會議開始先由三位共同協辦單位代表，包括：本署邱淑媿署長、馬來亞大學口腔癌整合研究中心主任—Rosnah Binti Mohd Zain與德州大學安德森癌症中心的 Dr. Ellen R. Gritz表發表演說，再由馬來西亞衛生部總司長 Dr. Noor Hisham Abdulllah 進行專題演講；會中另有馬來西亞衛生部口腔衛生司的司長，由此顯見馬來西亞政府對於檳榔危害防制議題之重視。邱淑媿署長於4月28日的第一場次—「口腔癌篩檢與早期診斷(Screening and Early Diagnosis)」演講，演講的主題為：「台灣國家型口腔癌篩檢計畫(National Oral Cancer Screening in Taiwan)」，其在演講過程中除了跟各國的學者分

享了18歲以上的成人嚼檳率在8年內下降幅度高達50%，成效斐然。是日下午2時0分至3時15分，先由邱淑媿署長代表演講，題目為演講的主題為：「口腔癌篩檢與早期偵測之研究(Research in Oral Cancer Screening & early detection)」，接著再將所有與會的學者依據討論的主題，分成四個圓桌小組進行討論，且由邱淑媿署長、佛羅里達大學的Dr. Roger L.Pake、明尼蘇達大學的 Dr. Dorothy Hatsukami等四人擔任桌長。每組討論12-15分鐘，成員的討論達成共識後由桌長作出結論，之後成員便移往下一桌，整個會議討論共進行了一個小時。藉此增進不同國家與不同領域的學者對於口腔癌症防治相關經驗的交流。(與會人員資料詳如附錄二)

二、專題演講 (Plenary session)

本署邱淑媿署長與各國聽眾分享之臺灣口腔癌症防治經驗：

- (一)制定並實施癌症防治法：立法目的在於作為整合運用醫療保健資源，有效推動癌症防治工作，減少癌症威脅，維護國民健康之依據。
- (二)政策溝通與社會參與：依法定期召開中央癌症防治會報及癌症防治政策委員會，進行橫向及縱向業務之協調與溝通，並透過產、官、學、民、媒合作推動癌症防治。
- (三)癌症防治實施現況：運用菸品健康捐補助經費，補助符合資格的民眾定其接受四癌篩檢，包括：大腸癌、口腔癌、乳癌、子宮頸癌；並透過研症篩檢品質提升計畫與門診資訊系統的改善來提升篩檢率、陽性追蹤確診與治療，且90%以上病人都在被診療品質認證的醫院接受治療。
- (四)癌症登記：現在仍有許多國家是由醫院來進行癌症登記，而非由政府主導。30幾年前，臺灣已開始運作癌症登記，而從中獲得各鄉鎮、各癌別的資料更是我國推行癌症防治政策的實證基礎。另外，臺灣癌症登記資料有ID〈Identification card number〉，從預防、篩檢到死亡或存活都可連結做資料加值分析。

(五)台灣口腔癌的現況與防治政策：跟35個OECD台灣的口腔癌發生率高居首位，而死亡率也僅次匈牙利；且其發生率與死亡率都佔國內男性十大癌症第四位，而口腔癌的發生年齡高峰為50-54歲這個年齡層，幾乎都是家庭主要的經濟支柱，因此口腔癌在台灣是一個相當重要的健康重要的議題，因此本署依據醫學實證，提供30歲以上(及18歲以上嚼食檳榔之原住民)有菸檳行為的民眾兩年一次口腔癌篩檢，每年可提供近百萬有菸檳行為的民眾篩檢服務，發現多達5,000癌前病變與癌症個案。此外，本署也與各地衛生局合作，透過實地訪查監測口腔癌篩檢品質，並藉由行政資源輔導篩檢品質不佳的醫療機構。

(六)檳榔危害防治：根據本署2009國民健康訪問調查的統計資料顯示：約有51.7%嚼檳者同時使用菸酒，又根據台灣學者的研究同時使用菸酒檳榔者罹患口腔癌的危險性為不使用這些物質的123倍；為了有效遏止檳榔的危害，本署透過建構「無檳支持環境」、發展「戒檳服務體系」、推動跨部會合作，包括：補助農委會辦理廢園轉作、補助國防部辦理菸檳防制計畫與提供戒檳衛教師資與課程協助環保署辦理戒檳課程等幾大策略，全面性的提升民眾對於檳榔的危害的認知，並降低成年嚼檳率。經過這些年的努力內18歲以上成年人的嚼檳率由2007的17.2%下降至2015年的8.8%。

三、分組討論 (Breakout session)

本次會議本署也將獲邀補助獲選之海報投稿者之住宿費、機票與註冊費，獎勵檳榔危害防治相關領域優秀學者參與本次會議，主辦單位依五項主題徵求海報，並依主題分組討論(獲選之海報內容摘述如附件三)，而邱淑媿署長除了在專題演講分享台灣口腔癌的防治策略，亦利用分組討論分享如何運用轉譯流行病學研究的過程與結果作為國家政策施行的基礎。

(一) 轉譯流行病學：Khoury等學者在2010年提出了轉譯流行病學的架構，主要強調將醫學研究結果的應用於族群健康影響中，流行病學所扮演的腳色，其架構可分為四個階段：

1. T1：從醫學研究發現到健康應用，運用臨床與族群的研究來歸納科學發現並評估藉健康介入措施。
2. T2：從健康應用到建立具實證基礎之醫療指引，運用觀察性與實驗性的研究來評估健康介入措施的成效。
3. T3：從醫療指引推行至醫療實務，評估介入措施的的成效並臨床指引，運用到臨床實務。
4. T4：從醫療實務擴展至民眾健康之影響的轉譯，並評估為衛生政策之效益。

(二) 制定預防保健政策參採之平台：在執行相關研究計畫可考量國外的政策，有兩個健康政策執行的平台，分別是美國預防醫學委員會（U.S. Preventive Services Task Force；簡稱USPSTF）與英國國家健康與照顧卓越研究院(National Institute for Health and Care Excellence；簡稱NICE)等兩個機構。USPSTF主要是由臨床醫療專家所組成，針對篩舉與預防醫學提出建議。另，NICE於1999年創立，原隸屬於NHS的一部份，2012年獨立成非政府部門公法人組織，由臨床專業人員、病人團體、經濟學家、NHS組織中的管理人員、與研究團體等人員所組成，主要在提供給各層級民眾有關治療與照護的相關訊息，並協助其做醫療決策。

(三) 執行預防保健服務項目之參採依據：USPSTF依據醫學實證與效益將預防醫學服務分為ABCDE五個等級；A-強烈建議醫師提供本項措施符合資格的受檢者，因為充足證據顯示可以改善健康，且利多於弊；B-建議醫師提供本項措施符合資格的受檢者，因為有證據顯示可以改善健康。C-不建議也不反對提供本項措施，雖然有證據顯示本項措施可以改善健康，但是也有證據可能顯示本項措施可能造成負面影響；D-不建議醫師提供本項措施給沒有症狀的受檢者，因為有證據顯示本項措施不法改善健康；E-反對醫師提供本項服務給受檢者，因為證據顯示該項措施無法改善健康且缺乏效益。目前各國在制定預防保健服務措施時，大多會選擇等級

為A或B級的項目，至於C等級的項目，各國擇當地的疾病盛行率與醫療資源再考量是否施行。

- (四) 研究設計：研究設計依其設計的嚴謹度可分為五個等級，I：其研究結果僅由一個隨機控制設計的研究取得；II-1：其研究結果由一個設計嚴謹的實驗研究取得；II-2：其研究結果由一個設計嚴謹的世代研究或病例對照研究取得；II-3：其研究結果由一個多重時間，且沒有介入措施嚴謹的實驗研究取得或者由非控制性的實驗取得，例如：penicillin的治療就可視為此種等級的實驗；III：專業團體針對臨床研究、個案報告、描述性研究的報告做出之結論。
- (五) 篩檢的研究指標：如果要執行篩檢的研究必須考量幾個因素：1.目標族群、篩檢措施；2.篩檢工具的信度(敏感性與特異性)與效度；3.篩檢措施的好處與缺點；4.陽性預測值與case yield；5.促進或阻礙研究的因素；6.發生率在疾病各期別的改變。

四、與專家會談

(一)與世界衛生組織癌症研究所主任 Dr. Kurt Straif會談

Dr. Kurt Straif為世界衛生組織轄下Section of IARC Monographs的主任。會談過程中，雙方除了就癌症篩檢的效益評估與策略進行意見交流，亦希望未來有機會合作。

(二)與Saman Warnakulasuriya會談

Saman Warnakulasuriya是世界組織轄下的主任，談論有關口腔癌的致成癮性與致癌性，世界各地嚼檳榔的盛行率與政府如何透過立法與執法來降低檳榔的販售與嚼食，亦希望未來可有更深入的交談與合作的機會。

五、其他演講者演講內容摘述

(一)James Parick, Team leader NCDs and Health throughout the

Life-course, WHO Cambodia :

Mr. Parick 的演講題目為：「Advocacy for Policy Development for Betel Nut and Tobacco Control」，其提出必須從五大平台去管理檳榔與菸草製品的供需問題：1.立法與政策；2.管理與地方政府執行；3.民眾的覺醒、教育、溝通與倡議；4.菸癮治療；5.調查與知識管理。此外，如果要採取行動時，則必須從四個層面著手：1.社會決定因素(環境、經濟與社會文)；2.危險因子(僅嚼檳榔、或同時使用菸檳與其他物質)；3.癌前病變(白斑或黏膜纖維化)；4.口腔癌或菸草導致的疾病。

(二) Alexander Ross Kerr, Department of Oral Maxillofacial Pathology, Radiology & Medicine, New York University :

Professor Kerr演講的題目為：「Oral consequences of areca nut products」，其報告中指出許多研究顯示，嚼檳榔會加速口腔黏膜下纖維化、口腔鱗狀細胞癌、牙周病等的病程，而同時嚼檳榔與吸菸者，發生病變的機率又更高。治療黏膜下纖維化可從幾個方面著手：戒檳、提昇營養與免疫力、物理治療與外科手術等。此外，在政策與研究方面，則必須要瞭解口腔黏膜癌前病變的自然史、確認嚼檳榔的族群，改善危險因子，並針對高危險族群施予介入措施。

(三) Dorothy K. Hatsukami, Professor of University of Minnesota:

Professor Hatsukami演講的題目為：「Oral Tobacco and Areca Nut Use: Current and Future Treatments」，其演講的內容主要包括：1.透過各種媒體與宣導活動強化藉菸檳的動機；2.運用檳榔成癮量表(Betel Quid Dependence Scare)戒菸檳使用情形與身體狀況以及是否並用其他物質；3.運用5A技巧來戒除成癮物質的使用—吸菸狀態(Ask)、建議戒菸(Advice)、評估戒菸意願(Assess)、協助戒菸(Assist)、安排追蹤(Arrange)。因為網路世代蓬勃發展，Professor Hatsukami也提到可以透過網路來提供成癮物質戒除的介入措施

(Web-based ST Cessation Intervention)，因為其成本低，隨時可以取得，且戒癮者也不需要花費時間到戒治中心。而影響其介入措施是否成功的因素包括：個別性的介入措施、長期追蹤以及每個人都可以得到專家與其他人的支持。

六、拜會馬來西亞衛生部(Ministry of Health)

邱淑媿署長與本署同仁亦利用本次到吉隆坡的機會，拜訪馬來西亞衛生部，該部接見的官員為Under Secretary of policy and international division 司長 Mr. Suhaimi bin Jusoh，及疾病防治之相關單位，會中針對無菸環境、電子煙的限制與法令規定之政策，肥胖、高血壓與糖尿病之慢性病防治策略，肥胖防治與糖稅，子宮頸癌的防治與子宮頸疫苗施打與口腔癌防治等議題進行討論，會中司長 Mr. Suhaimi bin Jusoh表示:希望馬來西亞與台灣就衛生人力訓練擴大合作。

肆、心得與建議

- 一、臺灣積極且全面性推動癌症防治相關工作，獲得本次大會與會貴賓的熱烈回響及讚賞，表示對於我國將癌症防治列為國家優先政策，訂有挑戰性的目標及癌症防治法，有籌措財源，有癌症登記資料庫，以及在世界衛生組織提出的「預防」、「早期發現」、「優質診斷與治療」以及「安寧照護」都有具體配套及監測，咸認為是Comprehensive national plan的實踐。我國癌症防治已建立各項資料庫，包括四癌篩檢資料庫與癌症登記資料庫，透過資料建立，分析屬於台灣的癌症狀況，並與世界各國進行比較與交流。
- 二、本次會議，邱淑媿署長分享了我國癌症防治的各項目標值，為了要下降20%死亡率，希望透過的各縣市衛生局與醫療機構的合作，能夠有效的降低癌症死亡率並有效延長癌症病患的生命。
- 三、台灣地區是全世界少數幾個國家執行口腔癌篩檢補助政策的國家，透過口腔癌篩檢傳遞檳榔危害與口腔癌防治的知識並養成民眾定期接受篩

檢的健康行為，甚而透過健康訊息的傳遞與專業人員的衛教，讓民眾減少嚼檳行為或戒檳。在各部會的努力下，嚼檳率已於八年內降幅達50%，足為各國學習之對象，未來可與各大醫學中心建立口腔篩檢實務交流學習平台，供東南亞各國醫療專業人員來台學習。

- 四、本次論壇有幾位學者提議向世界衛生大會提案，要求各國政府提出檳榔及口腔癌防治相關的有效行動，並研議仿照世界衛生組織菸草控制框架公約(WHO Framework Convention on Tobacco Control, 簡稱FCTC)研擬檳榔危害防制之國際公約。



圖一、邱淑媿署長演講照片



圖二、與重要貴賓共同合影

右一：馬來西亞衛生部總司長 Dr. Noor Hisham Abdullah
右二：美國國家癌症研究中心國際合作主任 Edward Trimble
左一：德州大學安德森癌症中心的 Dr. Ellen R. Gritz
左二：邱淑媿署長



圖三、主協辦單位代表合影

左一：美國國家癌症研究中心國際合作主任 Edward Trimble
左二：馬來亞大學口腔癌整合研究中心主任—Rosnah Binti Mohd Zain
左三：邱淑媿署長



圖四、與各國講者合影



圖五、與馬來西亞衛生部官員合影

右四：駐馬來西亞台北經濟文化辦事處章計平大使
左五：邱淑媿署長

附件一：大會議程表



National Cancer Institute



National Institute of Dental and Craniofacial Research



Ministry of Health and Welfare, Taiwan



UNIVERSITI MALAYA



MD Anderson Cancer Center



ORAL CANCER RESEARCH & COORDINATING CENTRE (OCRC)

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Ministry of Health Malaysia

Present the

International Conference on Betel Quid and Areca Nut

April 27-28, 2016
Kuala Lumpur, Malaysia
Le Meridien Hotel, Kuala Lumpur

With special thanks to the Scientific Steering Committee, including:

Healis -Sekhsaria Institute for Public Health, India
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The University of Malaya, Malaysia
US Centers for Disease Control (CDC), USA
US Department of Defense, USA
WHO Regional Office for the Western Pacific (WPRO), Philippines
WHO Regional Office for South East Asia (SEARO), India

Wednesday, April 27

Clark I Conference Room, Le Meridien Hotel

8:00 – 9:00 AM	Registration and Poster Set-up
9:00 – 9:45 AM	Welcome / Overview of Meeting <ul style="list-style-type: none">• Welcome by <i>Dr. Edward Trimble, Director, Center for Global Health, National Cancer Institute, National Institutes of Health, and Kalina Duncan, Center for Global Health, National Cancer Institute, National Institutes of Health</i> Remarks from Conference Sponsors <ul style="list-style-type: none">• <i>Dr. Shu-Ti Chiou, Director General, Taiwan Health Promotion Administration</i>• <i>Professor Rosnah Binti Mohd Zain, The University of Malaya, Oral Cancer Research and Coordinating Centre (OCRCC)</i>• <i>Dr. Ellen R. Gritz, The University of Texas, MD Anderson Cancer Center, US</i> Opening Ceremony <ul style="list-style-type: none">• <i>Opening by Datuk Dr. Noor Hisham Abdullah, the Honorable Director General of Health</i>
9:45- 10:15 AM	Keynote Address “Betel Quid, Areca Nut and Cancer - A Silent Killer”– The State of Science <i>Professor Saman Warnakulasuriya OBE, King’s College London and WHO Collaborating Centre for Oral Cancer and Pre-cancer</i>
10:15 – 10:45 AM	Break
10:45 – 12:15 PM	Plenary: Biology, Disease and Epidemiology Introduction by Session Chairs: <i>Dr. Prakash C. Gupta, Healis - Sekhsaria Institute for Public Health, India</i> <i>Professor Saman Warnakulasuriya OBE, WHO Collaborating Centre for Oral Cancer and Pre-cancer/ King’s College London</i> Biology Plenary Speaker: <ul style="list-style-type: none">• Oral consequences of areca nut products: <i>Dr. A. Ross Ken DDS, Department of Oral and Maxillofacial Pathology, Radiology & Medicine, New York University College of Dentistry</i>

Epidemiology

Plenary Speakers:

- The carcinogenicity of areca nut and the attributable burden of cancer: *Dr. Kurt Straif, Section Head, Section of IARC Monographs, International Agency for Research on Cancer (IARC)*
- Characteristics of betel quid users in India and Bangladesh and some less researched health effects: *Dr. Prakash C. Gupta, Healis - Sekhsaria Institute for Public Health*

12:15 – 1:45 PM Lunch Break and Poster Session

1:45 – 3:15 PM Plenary: Prevention, Addiction and Dependence

Introduction by Session Chairs:

Dr. Ellen R. Gritz, Department of Behavioral Science, The University of Texas, MD Anderson Cancer Center, US

Professor Dr. Amer Siddiq Bin Amer Nordin, Department of Psychological Medicine, Faculty of Medicine, University of Malaya

Dr. Mark Parascandola, Tobacco Control Research Branch, National Cancer Institute, US

Prevention

Plenary Speaker:

- Oral Cancer Prevention: Research in the Asia-Pacific Region: *Dr. Thaddeus A. Herzog, University of Hawaii*

Addiction and Dependence

Plenary Speakers:

- The Properties of Arecoline Suggest Links Between Betel Quid Use and Nicotine Addiction: *Dr. Roger L. Papke, University of Florida*
- Oral Tobacco and Areca Nut Use: Current and Future Treatments: *Dr. Dorothy Hatsukami, University of Minnesota*

3:15 – 3:45 PM Break

3:45 – 5:00 PM Breakout Sessions

Group 1 – Prevention, Addiction and Dependence

Party 2 Boardroom, Le Meridien Hotel

Group 2 – Biology & Epidemiology

Clark 1 Conference Room, Le Meridien Hotel

Thursday, April 28

Clark I Conference Room, Le Meridien Hotel

8:30 – 9:30 AM

Welcome and Overview of Day 2

Hedieh Mehrtash, Center for Global Health, National Cancer Institute, National Institutes of Health

Highlights of Day 1 Breakout Sessions

Moderators: Session Chairs from Day 1

Dr. Prakash C. Gupta, Healix - Sekhsaria Institute for Public Health, India
Professor Saman Warnakulasuriya OBE, WHO Collaborating Centre for Oral Cancer and Pre-cancer/King's College London
Dr. Ellen R. Gritz, Department of Behavioral Science, The University of Texas, MD Anderson Cancer Center, US
Professor Dr. Amer Siddiq Bin Amer Nordin, Department of Psychological Medicine, Faculty of Medicine, University of Malaya
Dr. Mark Parascandola, Tobacco Control Research Branch, National Cancer Institute, US

9:30 -- 11:00 AM

Plenary: Screening and Early Diagnosis of Oral Cancers

Introduction by Session Chairs:

Professor Rosnah Binti Mohd Zain, University of Malaya Oral Cancer Research and Coordinating Centre (OCRCC)
Dr. Ravi Mehrotra, Director, Institute of Cytology and Preventative Oncology

Best Practices and Case Studies in Screening in Early Diagnosis

Plenary Speakers

- Taiwan National Screening Program Case Study: *Dr. Shu-Ti Chiou, Director General, Taiwan Health Promotion Administration*
- Malaysian Oral Cancer Screening Programme: *Dr. Noor Aliyah bt Ismail, Principal Director of Oral Health Malaysia*
- Methods in assessing screening: A review of a RCT: *Professor Dr Yang Yi-Hsin, Kaohsiung Medical University, Taiwan*

11:00 – 11:15 AM

Break

- 11:15– 12:30 PM Plenary: Policy Interventions and Economics of Betel-Leaf and Areca Nut**
Introduction by Session Chairs:
Dr. Annette David, University of Guam, Guam
Dr. Chi Pang Wen, Professor, National Health Research Institutes, Taiwan
- Plenary Speakers:
- Policy Response to Address Betel Quid for Success of Tobacco Control: Experience from India: *Dr. Monika Arora, Public Health Foundation India (PHFI)*
 - Advocacy for Policy Development on Betel Nut and Tobacco Control in the Western Pacific Region: *Mr. James Rarick, World Health Organization (WHO), Cambodia*
- 12:30 –2:00 PM Lunch, Poster Session 2, Film Screening**
- 1:30 – 2:00 PM Lunch film Screening “The All-Chewing Truth in Papua New Guinea”**
Introduction by Mr. James Rarick, *World Health Organization (WHO), Cambodia*
Discussion by Ms. Anjelique Girannah and Ms. Renagi Taukarai, *U.S. Embassy Port Moresby*
- 2:00 – 3:15 PM Breakout Session 2**
- Group 1- Screening and Early Diagnosis of Oral Cancers**
Clark 1 Conference Room, Le Meridien Hotel
- Group 2 - Policy Interventions and Economics of Betel-Leaf and Areca Nut**
Parry 2 Boardroom, Le Meridien Hotel
- 3:15 -- 3:30 PM Break**
- 3:30 -- 4:15 PM Highlights of Day 2 Breakout Sessions**
Moderators: Session Chairs from Day2
Professor Rosnah Binti Mohd Zain, University of Malaya Oral Cancer Research and Coordinating Centre (OCRCC)
Dr. Ravi Mehrotra, Director, Institute of Cytology and Preventative Oncology
Dr. Annette David, University of Guam, Guam
Dr. Chi Pang Wen, Professor, National Health Research Institutes, Taiwan
- 4:15 PM Closing Remarks**

附件二、與會人員名單

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International Conference on Betel Quid and Areca Nut
Participant List by Country

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Bhutan		
	Dr. Choki Pema	Jigme Dorji wangchuk national referral hospital Thimphu Bhutan
Cambodia		
	Mr. James Rarick	World Health Organization, Cambodia
	Dr. Keam Ou SOR	University of Puthisastra, Cambodia
	Dr. Tepirou CHHER	Oral Health Bureau Ministry of Health, Cambodia
France		
	Dr. Kurt Straif	International Agency for Research on Cancer, France
Guam		
	Dr. Annette M. David	Health Partners LLC, Guam
	Dr. Yvette C. Paulino	University of Guam
India		
	Dr. Apurva Garg	Tata Memorial Hospital Mumbai, India
	Dr. Arthur Guyton	asdfd
	Dr. Dharendra Narain Sinha	Institute of Cytology & Preventive Oncology, India
	Dr. Gaurav Kumar	Mamta Health Institute for Mother and Child, India
	Dr. Gauravi Mishra	Tata Memorial Hospital, India
	Dr. Mira B. Aghi	Healis Sekhsaria Institute of Public Health, India

Dr.	Monika Arora	Public Health Foundation of India
Dr.	Nandu Meshram	Society for Oral Cancer and Health, India
Dr.	Prakash C. Gupta	Healis - Sekhsaria Institute for Public Health, India
Mr.	Ravi Kumar Seshadri	Fertin Pharma R&D, India
Prof.	Ravi Mehrotra	Institute of Cytology & Preventive Oncology, India
Dr.	Saritha Nair	National Institute of Medical Statistics Indian Council of Medical Research New Delhi India
Dr.	Todankar Priamvada	Nerotam Sekhsaria Foundation, India

Indonesia

Dr.	Indrayadi Gunardi	Trisakti University, Indonesia
Dr.	Rahmi Amtha	Trisakti University, Indonesia

Laos

Dr.	Dr Viengsavanh Inthakoun	Smilelink
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Dr.	Ahmad Khairuddin	Sarawak General Hospital, MOH Malaysia
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Dr.	Asmani Abdul Razak	PKPD Kuala Krai Kelantan, Malaysia
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Dr.	Aznilawati Binti Abdul Aziz	University of Malaya
Prof.	Cheong Sok Ching	Cancer Research Malaysia
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Dr.	George Boey Teik Foo	Hospital Queen Elizabeth, Malaysia
Dr.	Hartinie Bt Muhamad	Hospital Raja Perempuan Zainab II, Malaysia
Dr.	Hasni Bt Md Zain	PKPD Tangkak, Malaysia
Dr.	Jegarajan a/I N. S. Pillay	BKPKKM, Malaysia
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Dr.	Khairulzaman Bin Adnan	Hospital Sultan Hj Ahmad Shah Temerloh, Malaysia
Dr.	Khamisah Bt Awang Kechik	Hospital Raja Permaisuri Bainun Perak, Malaysia
Dr.	Lau Shin Hin	Institut Penyelidikan Perubatan KL, Malaysia
Dr.	Leslie Geoffrey	Pej TPKN(G), Malaysia
Dr.	Mannil Thomas Abraham	Hospital Klang, Malaysia
Dr.	Marzuki Bin Zainal Abidin	Pej TPKN(G), Malaysia
Dr.	Masitah Hayati Harun	University of Malaya
Dr.	Md. Arad Bin Jelon	Hospital Kuala Lumpur, Malaysia

Dr.	Md. Shahidul Ahsan	International Medical University, Kuala Lumpur
Dr.	Mohd Nury B Yusoff	Hospital Klang, Malaysia
Dr.	Mukhriz B Hamdan	Hospital Raja Permaisuri Bainun Perak, Malaysia
Dr.	Nomah bt Tahrim	BKPKKM, Malaysia
Dr.	Nor Nazaliza bt Basri	Hospital Kuala Lumpur, Malaysia
Dr.	Noor Aliyah bt. Ismail	Principal Director of Oral Health Malaysia, BKPKKM, Malaysia
Dr.	Norlida Bt Abdullah	BKPKKM, Malaysia
Dr.	Nur Faziiah bt Mohd Tahir	Hospital Sultan Ismail Johor, Malaysia
Dr.	Nur Ikram Hanim bt Abd Rahim	Hospital Kuala Lumpur, Malaysia
Dr.	Nurshaline Pauline Bt. Hj. Kipli	Hospital Umum Sarawak, Malaysia
Ms	NURUL ANIS BINTI AHMAD RIDZUAN	University of Malaya
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Dr.	Sumairi B Ismail	Hospital Sultan Abd Halim 5g Petani, Malaysia
Ms.	SUZANNA EDGAR	University of Malaya
Dr.	Tay Keng Kiong	Hospital Umum Sarawak, Malaysia
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Dr.	Yaw Siew Lian	BKPKKM, Malaysia
Mr.	Zachary Yong Wei Ern	University of Malaya
Prof.	Zainal Ariff Bin Abdul Rahman	University of Malaya
Dr.	Zaiton Bt Tahir	PejabatPergigian Kawasan Kota Belud, Malaysia
Dr.	Zuraiza Binti Mohd Zaini	University of Malaya
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Myanmar		
Dr.	Aye Aye Win	University of Public Health Yangon

Ms. Khin Thiri Maung	HelpAge International, Myanmar
Dr. Myo Min Thane	Department of Medical Research, Myanmar
Dr. Nwe Nwe Oo	University of Public Health, Myanmar
Dr. SU SU HLAING	University of Public Health, Myanmar
Dr. THET THET MAR	Department of Medical Research Ministry of Health, Myanmar

Nepal

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Dr. Madhu Shrestha	Hiroshima University, Nepal
Dr. Yagya Bahadur Karki	Population Health and Development (PHD) Group, Nepal

Northern Mariana Islands

Ms. Amy Lynn Babauta	Commonwealth HealthCare Corporation, Northern Mariana Islands
Dr. Margarita Torres Aldan	Commonwealth HealthCare Corporation, Northern Mariana Islands
Mrs. Velma Del Rosario	Commonwealth HealthCare Corporation, Northern Mariana Islands

Palau

Ms. Candace Koshiba	Prevention Unit, Palau Ministry of Health
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Papua New Guinea

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Dr. Paulias Miroi	Cancer Foundation, Papua New Guinea
Ms. Renagi Taukarai	U.S. Embassy Port Moresby, Papua New Guinea

Philippines

Dr. Anita Das	US National Cancer Institute Center for Global Health (Southeast Asia Liaison)
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Sri Lanka

Prof. GANANANDA NANAYAKKARA	FACULTY OF MEDICINE UNIVERSITY OF RUHUNA GALLE SRI LANKA
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Dr. Pei-Chun Hsieh	Health Promotion Administration, Taiwan
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Dr. Wen-Pin Hsu	Health Promotion Administration, Taiwan

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附件三、會議海報摘要

Neuro-Oncology Abstracts

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Abstract Booklet*

Biology, Disease and Epidemiology

Detection of micronuclei in the buccal mucosa of areca nut and gutka chewers* (Poster #1)
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Introduction: The chewing of Arecanut is a common habit amongst all sections of society in South East Asia. Arecanut and commercially available products like Gutka contain genotoxic components that result in damage to cells leading to oral cancer. The frequency of occurrence of micronuclei has been used as an important dosimeter for assessing the genotoxic effects of chemical mutagens.

Objectives: The objective of the study was to assess the genotoxic effects of arecanut and Gutka and to quantify the number of micronuclei in buccal mucosa of arecanut and Gutka chewers.

Materials and method: The study was conducted in Manipal College of Dental Sciences, Mangalore, India (2008-2010). The study consisted of 140 individuals which included 3 groups. Group I was the control group that included 70 healthy individuals. Group II (subject) were arecanut chewers and Group III (subject) were Gutka chewers, with 35 individuals in each group. In the present study, the micronucleus test was applied to smears obtained from buccal mucosa of all 140 individuals.

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Abstracts with poster presentations at the conference are marked with an (). This list represents all accepted, not withdrawn, abstracts. Due to travel limitations, not all accepted abstracts will be presented at the conference*

Results: Out of the two varieties of arecanut, 80% were red variety and the rest 20% were white variety of arecanut. The results of this study showed that there was a significant elevation in micronucleated cells from the exfoliated oral mucosal cells obtained from arecanut chewers and Gutka chewers over control samples.

Conclusion: The increase in the number of micronucleated cells observed in chewers reinforced the possible genotoxic damage in chewers.

Correlation between oral submucous fibrosis and various clinicopathological and biochemical parameters in oral cancer* (Poster #2)

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Objective: Oral cancer is the most common cancer in Indian males and is the third most common cancer in Indian females. The most common etiological factors in India are tobacco and areca nut. The aim of this study was to assess the correlation between Oral Submucous Fibrosis (OSMF) and the various clinicopathological and biochemical parameters in oral cancer. A high incidence of oral submucous fibrosis (OSMF) is linked to areca nut chewing in the Indian subcontinent and its use is also linked to diabetes mellitus, cardiac diseases, hepatotoxicity, etc.

Methods: We prospectively studied 371 consecutive patients with proven squamous cell carcinoma of the oral cavity. Of these, 112 patients had oral cancer with OSMF and 259 had oral cancer without OSMF. All patients underwent standard management and their clinicopathologic and biochemical findings were recorded.

Results: We found that patients of oral cancer with OSMF were younger males with better prognostic factors such as lesser incidence of nodal metastases, extracapsular spread and better grade of tumor differentiation. OSMF did not show any statistically significant relation to the studied biochemical abnormalities like impaired liver enzymes, raised blood sugar levels or abnormal WBC counts, etc.

Conclusions: Based on these findings we propose that oral cancers with OSMF constitute clinicopathologically distinct disease but it does not have any significant association with biochemical abnormalities. Since all patients with OSMF had chewed areca nut with or without smokeless tobacco, we believe that the differences in the 2 groups arise from differential mechanisms of areca nut carcinogenesis.

The influence of areca (betel nut) chewing on the oral microbiome* (Poster #3)

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Objectives: We sought to evaluate the influence of betel nut chewing on the oral microbiome.

Materials and Methods. Adults with and without a history of betel nut use were recruited from a dental clinic in Guam. Oral cell and saliva samples were collected and the presence of oral lesions was evaluated. Roche 454 FLX Titanium based pyrosequencing was used to target the V3-V5 regions of the 16S ribosomal RNA bacterial gene.

Results. One hundred twenty-two adults were enrolled. Sixty-four individuals reported current use of betel nut, 37 were former chewers, and 21 had no history of betel nut use. Oral lesions were observed in 9 betel nut users and oral submucous fibrosis in 1. Overall, oral bacteria taxa included 101 distinct genera and 74 distinct species. Specific taxa were detected more frequently and in greater abundance in current betel nut chewers compared to past/never chewers including the order Streptophyta (27% vs. 5% $p=0.002$); genera *Acholeplasma* (9% vs. 0%, $p=0.02$), *Campylobacter* (31% vs. 14%, $p=0.02$), and *Sharpea* (17% vs. 5% $p=0.04$); and species *Prevotella nigrescens* (20% vs. 7%, $p=0.03$). Streptophyta was also more predominant in ever vs. never betel nut chewers (19% vs. 0%, $p=0.03$) and those chewing for ≥ 10 years relative to never chewers (32% vs. 0%, $p=0.03$). The genus *Staphylococcus* was detected with greater frequency and abundance in individuals with oral lesions compared to those without lesions (89% vs. 23% $p<0.0001$).

Conclusions. Betel nut chewing may change the composition of the oral microbiome, including the establishment of periodontal pathogens.

Betel quid use as the primary form of tobacco use among Cambodian women: trends indicating a persistent burden across a decade of national tobacco surveys (2005 to 2014)

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In 2005, NIH-funded researchers from Cambodia National Institute of Statistics, Ministry of Health, WHO, SEATCA and Loma Linda University reported findings from the first national prevalence survey of tobacco use indicating that among the 2 million tobacco users in Cambodia, 500,000 were women who chewed tobacco in the form of a betel quid. During 2005 to 2014, landmark public health measures were taken to reduce tobacco use in Cambodia, including placing health warnings on cigarette packs, banning all forms of tobacco advertising, increasing excise tax on tobacco, and the recent adoption of a comprehensive tobacco control law that included pictorial health warnings on tobacco packaging and stronger enforcement for smoke-free environments. Despite the efficacy of these measures, findings from a decade of nationally representative surveys indicate a persistent burden of betel quid use that remains unchanged among half a million Cambodian females. It has been documented in the scientific literature that the betel quid habit in Cambodia is associated with higher rates of infant mortality, infectious disease, and oral cancer. This presentation will show secondary analysis of data from both 2011 and 2014 National Tobacco Surveys conducted in Cambodia. Findings are relevant to the design of effective measures that can address both supply and demand of betel quid in target populations in which betel quid and tobacco use are prevalent.

Areca nut use in India: Findings from Global Adult Tobacco Survey* (Poster #4)

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Background: Areca nut is a widely used substance globally specially as an ingredient in betel quid. Its use is widespread from countries of South Asia right up to Pacific Islands of Saipan and Guam.

Objective: We have investigated the prevalence of the use of areca nut, betel quid, pan masala with and without tobacco from the GATS India data.

Methods: We constructed contingency tables and conducted chi-square test to compare relationship between areca nut use with and without tobacco by several other characteristics. We conducted logistic regression analysis to look at the noticing of marketing of smokeless tobacco products and areca nut users with and without tobacco.

Results: The overall prevalence of user of areca-nut with tobacco was 12.7% and without tobacco, 0.6%. Among male the use of areca nut with tobacco was reported by 18% and without tobacco, by 0.6%. Among female with tobacco and without tobacco use was 7% respectively, 0.6%. The estimated number of users of areca nut without tobacco in India was 4,931,632 and with tobacco, it was 101,002,365. The difference between two categories was significant using chi-square for noticing any health warnings, money spent on smokeless tobacco (SLT) and the age of initiation of SLT which was lower among non-tobacco users.

Conclusion: This study points out areca nut use as a specific problem of the country with at least 5 million regular users in addition to those using tobacco.

Alkaloid profiles of commercial areca nut-containing products: Implications for addiction and carcinogenic potential* (Poster #5)

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Use of areca nut-containing products, such as betel quid or commercially-produced pan masala and gutkha, is associated with a range of negative health outcomes, ranging from addiction to various non-malignant and carcinogenic effects, particularly oral and esophageal cancers. Chemical composition of these products, which is affected by the characteristics and the amount of areca nut as well as by the presence of other ingredients, is most likely one of the key contributors to the associated health outcomes. Arecoline, arecaidine, guvacoline, and guvacine are areca nut-specific alkaloids that have been implicated in both the abuse liability and the carcinogenicity of areca nut. Arecoline is believed to be the major addictive alkaloid in areca nut and has been shown to modulate a range of cellular enzymes such as matrix metalloproteinases and lysyl oxidase, as well as inhibit p53 mRNA expression and DNA repair. Contribution of other alkaloids to the addictive potential of areca nut-containing products is not known; however, they have been shown to be positive in bacterial mutagenicity assays and induce macromolecular changes in mammalian cells. Furthermore, areca nut alkaloids can undergo nitrosation in the oral cavity of users, leading to the formation of areca-derived nitrosamines (ADNA),

some of which have been shown to cause DNA damage. The rate of such endogenous nitrosamine formation can depend on a number of factors, including product pH and the presence of other constituents that may serve as the source of nitrosating species. Therefore, variations in the levels of areca alkaloids and other constituents could potentially contribute to variations in addictive and carcinogenic potential across areca nut-containing products. However, such information is virtually non-existent. We have developed a sensitive and accurate liquid chromatography-tandem mass-spectrometry method for the analysis of arecoline, arecaidine, guvacoline, and guvacine and applied this method to the analysis of a range of products obtained from India and China. The samples included commercial products (pan masala and gutkha) as well as different forms of areca nut (bulk product of different cut size as well as commercially packaged areca nuts). Our findings indicate that there is substantial variation in the relative amounts of measured alkaloids across various products. In addition, preliminary data suggest that presence of other ingredients, such as tobacco, in the areca nut-containing products may affect the rate of ADNA formation in oral cavity of users. Our research highlights the need to characterize the chemical diversity and the associated addictive and carcinogenic potency of commercial and cottage areca nut-containing products. Further studies on areca nut alkaloid nitrosation in the oral cavity, and the effect of product characteristics on the rate of this process, are needed to better understand the association between areca nut constituent exposure and the induction of genotoxic damage and cancer in users.

Identification of pro-inflammatory molecules involved in Areca nut-mediated carcinogenesis* (Poster #6)

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Betel nut consumption has significant implications for the public health globally, as the wide-spread habit of Areca chewing throughout Asia and the Pacific is associated with a high prevalence of oral carcinoma and other diseases. Despite a clear causal association of betel nut chewing and oral mucosal diseases, the biological mechanisms that link Areca nut-contained molecules, immune cell activation, cytokine production, inflammation, and cancer remain underexplored. We observed that the Areca nut extract is capable of mobilizing calcium in a dose-dependent manner in various cells of the innate and adaptive immune system, which can support the production and release of pro-inflammatory mediators, contribute to chronic inflammation, and ultimately play a role in oral disease of betel nut chewers. Interestingly, none of the four major alkaloids (arecoline, arecaidine, guvacine and guvacoline) of Areca nut were able to induce such Ca²⁺ signals, suggesting that the active components might represent novel or so far unappreciated chemical structures. The separation of the Areca nut extract processed by means of reversed phase high-performance liquid chromatography (HPLC) has further revealed multiple active fractions with differential response spectra in the tested immune cell lines (mast cells, monocytes, T cells), suggesting the presence of more than one calcium-mobilizing compound. In addition, we determined that fractions obtained from Areca nut variants sourced from Hawaii and Guam exhibit differential patterns of pro-inflammatory activities. Ongoing structural analyses will help us elucidate the chemical structures of the pro-inflammatory compounds and their relative abundance in Areca nut variants.

The role of physical activity in harm reduction among betel quid chewers from a prospective cohort of 419,378 individuals* (Poster #33)

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Objective: To assess the benefits of regular exercise in reducing harms among the betel quid (BQ) chewers.

Methods: The study cohort, 419,378 individuals, participated in a medical screening program between 1994 and 2008, with 38,324 male and 1,495 female chewers, who consumed 5-15 quids of BQ a day. Physical activity of each individual, based on "MET-hour/week", was classified as "inactive" or "active", where activity started from a daily 15 minutes/day or more of brisk walking (≥ 3.75 MET-hour/week). Hazard ratios for mortality and remaining years in life expectancy were calculated.

Results: Nearly one fifth (18.7%) of men, but only 0.7% of women were chewers. Chewers had a 10-fold increase in oral cancer risk; and a 2-3-fold increase in mortality from lung, esophagus and liver cancer, cardiovascular disease, and diabetes, with doubling of all-cause mortality. More than half of chewers were physically inactive (59%). Physical activity was beneficial for chewers, with a reduction of all-cause mortality by 19%. Inactive chewers had their lifespan shortened by 6.3 years, compared to non-chewers, but being active, chewers improved their health by gaining 2.5 years. The improvement, however, fell short of offsetting the harms from chewing.

Conclusions: Chewers had serious health consequences, but being physically active, chewers could mitigate some of these adverse effects, and extend life expectancy by 2.5 years and reduce mortality by one fifth. Encouraging exercise, in addition to quitting chewing, remains the best advice for 1.5 million chewers in Taiwan.

Prevalence of Areca nut usage among school students in Mumbai* (Poster #10)

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¹Narotam Sekhsaria Foundation, India; ²Salaam Bombay Foundation, India

Research Objective: To estimate prevalence of Areca nut usage among school students

Methods: A large scale survey covering 1918 students of 7, 8, 9 grades from 12 schools conducted using self-administered questionnaire in Hindi, Marathi and Urdu languages. Data Analysis was conducted using SPSS 23. Descriptive frequencies; chi-square and Independent sample T test were used. A p value of <0.05 was considered significant.

Results: Ever use of areca nut was reported by 32.5% and significant differences were observed with respect to gender and grade. Higher Percentage of male students, 9th grade reported ever use. Mean age of initiation was 11.8 yrs. Gender specific differences were insignificant.

Recent behaviour was captured by asking 30 and 7 days use and it was noticed to be 17.6 %, 13.7% respectively. 66.0% reported an association between health problems and areca nut usage. 52.3% reported it is possible to purchase areca nut within 100 yards of the school and 1.2 % indicated intention to use in next 12 months. Gender specific significant differences with male students having higher

intention and more knowledge were observed. Similar differences were observed with respect to attitudes 'use of areca nut is a cool behaviour' and 'it makes people free from stresses'.

17.4% shown interest in cessation programme, 83.8% prefers group sessions and 62.2% felt it should be provided in school.

Conclusions: Areca nut usage starts at early age. Gender differentials in attitude and usage are very evident. There is an imperative develop

Notification to betel quid chewers for aflatoxin B1 contamination in areca nuts (Areca catechu Linn.)* (Poster #7)

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Background: Areca nut is main component of betel quid and enjoyed in South and Southeast Asia. Aflatoxin B1 (AFB1) is the naturally occurring secondary metabolite and most potent hepatic carcinogen and mutagen produced by certain species of *Aspergillus flavus*, *Aspergillus parasiticus*.

Objective: To determine the AFB1 level in areca nuts and notify the betel quid chewers about the danger of AFB1 contamination in areca nuts.

Materials and Methods: Total of 42 areca nut samples were collected from 26 betel quid shops, five retailers and 11 markets in Yangon region. ELISA method was used to determine the level of AFB1 in tested samples.

Results: All samples were contaminated with AFB1 in this study. The detected levels of AFB1 were 7.05-21.58ppb in 26 samples (61.9%), 5.18-21.66ppb in 5 samples (11.9%) and 5.48-21.08ppb in 11 samples (26.2%) respectively. AFB1 level of all samples was more than maximum permissible level of 5ppb according to the European Commission.

Conclusions: This study highlighted that AFB1 was contaminated in areca nuts and to promote awareness for presence AFB1 in areca nut among the betel quids or areca nut chewers. Betel quid and areca nut chewing are not only major risk factor of oral cancer but also chronic exposure of AFB1 at low levels lead to a high risk of developing cancer and low resistance to infectious diseases.

Recommendation: Regular monitoring for contamination of AFB1 in areca nut should be promoted. The education to use rapid test kits for AFB1 determination should be given to betel quid sellers.

Exploratory Analysis of 51 cases of oral squamous cell carcinoma coexisting with oral submucous fibrosis at a tertiary care hospital in Central India

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Aim & objectives: To explore association of OSF with OSCC and to ascertain likely role of chewing habits prevailing in the central India population in etiology of oral carcinoma.

Materials and Methods: A hospital-based retrospective analytical study was performed at Government Dental College Hospital, Nagpur. A series of 188 patients of histopathologically diagnosed oral squamous

cell carcinoma in last three years (2013 to 2015) was analyzed based on their age, gender, regional distribution, chewing habit's pattern and history of oral submucous fibrosis. Results: A high proportion (51 cases, 27.1%) out of 188 histopathologically diagnosed OSCC cases were found associated with OSF. A significant (p-value < 0.01) proportion of these 51 OSF cases reported habit of chewing kharra/mava (crude mix -about 8gms- of tobacco+areca nuts, sprinkled on cellophane paper and mixed vigorously with slaked lime chewed constantly trough out the day, sometimes left in mouth overnight) as compared to other chewing habits prevalent in central India population (odds ratio 2.65, 95% CI: 1.2-5.5). OSCC was also found significantly associated (p-value < 0.01) with younger OSF patients having odds ratio (≤ 45 versus 45+ years old) of 2.2 (95% CI 1.09- 4.5).

Conclusion: Young patients of OSF in central India with habit of kharra/mava chewing carry increased risk of developing carcinoma as compared to those not having OSF and kharra chewing habit. Future prevention strategies need to target this young and kharra-addicted population.

The impact of betel quid chewing during pregnancy on pregnancy outcomes in Bhutan* (Poster #8)

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Between February 2015 and February 2016, a hospital-based unmatched case-control study was conducted at the three referral hospitals in Bhutan to explore the impact of betel quid chewing on adverse pregnancy outcomes. A semi-structured questionnaire was used to collect information on the potential risk factors and confounding variables from the mothers and to understand the behavior of alcohol, smoking, and betel quid chewing. The study population were the low birth weight and/or preterm birth neonates born in the three regional referral hospitals and their mothers (Planned sample size=776).

The Interim analysis using the single entry data between February and December 2015 shows that between 50% and 60% of mothers in both case and control group chewed betel nuts during pregnancy while self-reported smoking during pregnancy was between 2 and 5%. The data also suggests high prevalence of gestational hypertension among Bhutanese pregnant women. In the univariate analysis, sex of the baby, parity, smoking during pregnancy, snuff and chewing tobacco, drinking during pregnancy, mother's stated hypertension, recorded gestational hypertension, recorded preeclampsia, recorded eclampsia, mode of delivery, type of delivery, and previous preterm were found to have a statistical significant impact on low birth weight and/or preterm births at the 5% level of significance. Final analysis including multivariate analysis will be conducted using double-entered data. Similar prevalence of betel nuts chewing in both cases and controls may make it difficult to demonstrate the statistically significant difference between the two groups. Details including dose-effect of betel nuts chewing will be examined.

Areca (betel) nut chewing and oral health in the Mariana Islands* (Poster #9)

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Objectives: We sought to detect oral potentially malignant disorders (OPMDs) among areca (betel) nut chewers, and to assess the prevalence of the oral human papillomavirus (HPV) infection in a subset of chewers, in Guam and Saipan, Mariana Islands.

Materials and Methods: A cross-sectional study of 300 adult (≥ 18 years) betel nut chewers was conducted among households in Guam and Saipan from January 2011 to June 2012. Trained and calibrated researchers collected information on betel nut use and health-related risks and performed an oral screen for oral potentially malignant disorders (OPMDs). Positive cases were referred to the study dentist for a second oral examination. Buccal smears were collected from a subset (n=123) to test for the oral HPV.

Results: The adults surveyed were from 194 households, which included 718 betel nut chewers. The range of chewers was one to eight per household. The age ranged from 9 to 86 years old. Twenty-seven chewers were minors (<18 years). Of the 300 adults, some chewed with tobacco (68%), with slaked lime (75%), with betel leaf (72%), while 35 chewed the nut alone. Eighty-nine (30%) visited the dentist regularly. Forty-six (15%) of the 300 adults had OPMDs and one (0.3%) was confirmed to have squamous cell carcinoma. The prevalence of HPV was about 6% (7/123), although none were high-risk types.

Conclusion: Betel nut chewing was common among household members, which may include children. The identification of OPMDs and HPV in the adults suggests that betel nut chewers, including children, will benefit from oral screening.

Prevention, Addiction and Dependence

Qualitative study for betel quid cessation among oral cancer patients in Taiwan* (Poster #11)

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Objectives: This study aims to explore the behavioral changes of betel quid chewers who have been diagnosed with oral cancer under a trans-theoretical model framework.

Materials and Methods: 30 oral cancer patients with betel quid chewing history were chosen for in-depth interviews and analytic induction.

Results: Our research showed that betel quid chewers with oral cancer typically experience four significant stages of behavior: pre-contemplation, contemplation, action, and maintenance. Each stage change was marked by specific characteristics. For example in the pre-contemplation stage, chewers showed positive expectancy toward the psychoactive or social effects of betel quid. In the contemplation stage, chewers realized the negative effects of betel quid, such as dental or other physical problems. Some chewers also learned they were addicted to betel quid and realized it was difficult for them to stop chewing it. Chewers generally showed insignificant characteristics in the preparation stage and most chewers reported going "cold turkey" when they decided to quit. In the action stage, some chewers successfully quit betel quid and attributed it to willpower. Those quitting because of the loss of oral functions were unable to chew anymore though some chewers had experienced relapse. In the maintenance stage, ex-chewers reported getting rid of addiction, however, relapse was possible. In this study, those with oral cancer suffered a tremendous psychological impact though they usually started quitting betel quid, cigarette, and alcohol together immediately after receiving cancer diagnosis with less chance of recurrence.

Conclusions: This study provided important information for developing betel quid cessation programs.

Barriers to quitting betel quid for Taiwanese chewers* (Poster #12)

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Objective: Most of Taiwanese betel quid (BQ) chewers failed to quit. This study tried to find the reasons why chewers cannot succeed to quit in Taiwan.

Methods: The qualitative design was used for answering the research questions. The data were collected by four focus groups including a total of 24 participants recruited by purposive sampling. The qualitative recordings of content in 4 focus groups were analyzed by content analysis process.

Results: Two major themes were found to explain the reasons of Taiwanese chewers failed quitting BQ. The first theme is "no confidence in quitting BQ chewing on one's own" with 5 subthemes. They are: 1) experience obvious decline in energy, reaction, and physical strength right after quitting and feel desperate to resume chewing; 2) feel teeth loose and unbearably sore right after stopping BQ chewing; 3) lack of positive model of success for encouragement; 4) perception of the influence of one's physical constitution on the degree of addiction and the odds of successful cessation; and 5) hope that there

would be something to replace BQ to help cope with withdrawal symptoms. The second major theme is "too many temptations to achieve successful cessation" with 3 subthemes. They are: 1) temptations galore, including generous offers from friends; 2) betel quid can be purchased virtually everywhere; and 3) keep haunted by the smell of BQ.

Conclusions: The major factors were found to influence Taiwanese chewers quitting BQ and the data are valuable to help understanding why chewers failed to quit the BQ.

Community Based Tobacco Cessation Programme among Women in Mumbai, India* (Poster #19)

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Aims: To provide tobacco cessation services to women in community to help them quit tobacco and identify factors associated with tobacco quitting. The overall goal was to document the processes involved so as to establish a model tobacco cessation programme which could be replicated elsewhere.

Methods: This is a community based tobacco cessation programme conducted over a period of one year in a low socio-economic area of Mumbai, India. Initial survey showed that 14.92% women residing here consumed tobacco in some form or the other. The women were interviewed to record the socio-demographic and risk factor history followed by interactive health education session. This was followed by three interventions conducted at three monthly intervals and a post intervention follow-up. The interventions were in the form of health education, games and counseling sessions.

Results: The average compliance to participation in programme in the four rounds was 93.31%. The mean age at initiation of tobacco was 17.31 years. Use of tobacco among family members and in the community were important reasons for initiating tobacco while addiction to tobacco was an important reason for continuation of tobacco use. The quit rate at the end of the cessation programme was 33.46%. The multivariate logistic regression analysis shows that younger age and consumption of tobacco only at home were significantly associated with tobacco quitting.

Conclusions: Changing the cultural norms associated with smokeless tobacco use in the community and providing cessation services are important measures in preventing initiation and continuation of tobacco among women in India.

Areca nut cessation programme for schoolchildren: Lessons from 14 schools in Mumbai, India

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Objectives:

1. To create awareness about the ill effects of areca nut and tobacco among schoolchildren in 14 schools of Mumbai.
2. To provide cessation service to voluntarily registered users among these children.

Materials and Methods: Orientation sessions about ill-effects of tobacco and areca nut (supari) were conducted for 5739 students from 14 schools in slum areas of Mumbai using presentations and videos. 718(13%) students voluntarily registered for the LifeFirst cessation service of which 36(5%) were tobacco users, 576(80%) areca nut users and 106(15%) used both type of products. LifeFirst involves six

theme-based sessions with groups of 10-15 students each over six months. Presentations, videos, group discussions, games are used in the sessions to probe the reason of initiation and triggers. Coping mechanisms and refusal skills are instilled to bring about behavioral modification. The sessions are based on established cessation techniques adapted for children by involving specialists in child psychology.

Results: Of the 582 registered areca nut users, 668(98%) students completed the entire programme and 472(69%) among them reported as not using areca nut at the sixth session, 42(6%) reported reduced use while 8(1%) reported relapse.

Conclusions: Areca nut, the fourth most psychoactive substance which is a known Group1 carcinogen also acts as a gateway product for tobacco use among children. Providing scientific, structured cessation services to areca nut users among schoolchildren is an effective way of preventing its ill-effects and also preventing the initiation use of tobacco products.

“When you have a toothache, you just chew betel quid”: A qualitative study exploring attitudes and perceptions of betel quid consumption and its oral health implications in Taiwan* (Poster #14)
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Objective: This qualitative study discusses findings concerning betel quid (BQ) use and oral/dental diseases that can be considered in developing health promotion initiatives and cessation efforts in Taiwan, where the dental workforce could have a pivotal role.

Methods: Fifteen in-depth interviews and 4 focus groups discussions were conducted. Men and women over 18 years of age and who self-identified as current and former BQ users were included in the study. Discussion was tape-recorded and transcribed. Interpretative analysis was undertaken manually and themes and emerging key points were developed into a thematic framework.

Results: The sample was 66% male and 34% female, 41.02±9.23 years old on average. Participants agreed that most of the health consequences of BQ chewing occur in the oral cavity (e.g., flat teeth, bad breath, oral ulcers, and gum disease, among others). The most frequently mentioned withdrawal symptoms related to dental/oral conditions were: damage to the enamel surface (coloration and/or erosion), tooth ache, tooth loss, bitter taste, and increased salivation.

Conclusions: BQ chewers must receive routine oral screenings and extensive documentation of oral soft tissue lesions. In addition, dental professionals in Taiwan should be aware of the negative oral/dental effects caused by BQ chewing and be prepared to advise patients on cessation strategies. Dental professionals and oral health stakeholders must have an active involvement in shaping future public health policies on BQ prevention and control in Taiwan.

How to control betel quid addiction, where we are? Thailand and Bangladesh Perspective

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Background: Mobile health (mHealth) is an emerging discipline for medical and public health practice. The first-ever CDC report on the global use and public health impact of smokeless tobacco finds that more than 300 million people in at least 70 countries use these harmful products. The serious health effects of smokeless tobacco have been documented. GATS Bangladesh 2009 reported that among all respondents 26.4% of men, 27.9% of women, and 27.2% overall currently use smokeless tobacco. 7 out of 10 want to quit tobacco. GATS Thailand 2009 report found that 1.3% of men, 6.3% of women, and 3.9% overall currently use smokeless tobacco. Betel quid has different health hazards. The project was done to develop a mobile app to quit betel quid and empower people about health issues regarding betel quid.

Methodology: This was a cross sectional qualitative study that was conducted in January 2016 in Thailand. Ten semi-structured interviews were conducted with physicians who were living in Bangkok, Thailand.

Results: The respondents noted the lack of resources on smoking and betel quid use for people and suggested the following: an audio-visual tool, mobile app with information on smoking and betel quid that could be downloaded for their clients; a poster that could be used in fact sheets. Due to low literacy, it was suggested that information be disseminated verbally via health professionals, religious leaders, existing programs that people attend, and visual social media (e.g. Facebook, YouTube).

Conclusion: The mobile application will be a good tool to quit betel quid.

Developing a Betel Quid Cessation Program: Challenges and Recommendations

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This research reports on some of the challenges researchers encountered in implementing a betel quid cessation program on the US Territory of Guam from June 2014 to August 2015. This program was adapted from a proven cognitive-behavioral tobacco cessation program. Five cessation group meetings were held over a twenty-two day time period. Participants were provided incentives for attendance at meetings and for filling out surveys concerning their betel nut habit. Audio recordings were also made of group meetings. Participants were recruited through several strategies including: advertisements in the local publications distributed throughout the island, posters and brochures that were displayed at public health agencies, local mayor's offices and other public places. Difficulties with recruitment using this method led researchers to add a recruitment incentive for existing participants to bring in additional participants. The family-centric nature of the island community combined with transportation difficulties led to respondents to bring entire families, including young children, which led to some complications. The program asked respondents who chewed to use a "healthy" substitute for betel nut, but many reported an increase in the consumption of junk food and smoking as they began the quitting process. Another step in the quitting process asked respondents to reward themselves for their efforts by treating themselves to a fun activity they enjoyed. However, many participants had difficulty affording such incentives. These challenges are discussed with an aim to help improve approaches to betel quid cessation in the future.

Knowledge and beliefs of medical and dental students in Cambodia about betel quid chewing* (Poster #15)

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Objective: To investigate the knowledge and beliefs of medical and dental students concerning betel quid chewing.

Methods: 100 senior students were interviewed by 3 trained interviewers.

Results: Perceived reasons for chewing betel quid included: good taste (51%); good feeling (17%); traditional habit (66%). 85% said they would be unhappy if their parent took up the habit. 75% of dental and 28% of medical students said that chewing betel quid could cause general health problems. All but one said that chewing could cause oral health problems, including: tooth problems (91%); gum problems (82%); soft tissue problems (80%). Only 22% of students said the habit could cause oral cancer. 62% of dental and 6% of medical students said they had been taught how to examine the oral soft tissues. 80% of dental and 6% of medical students said they had been taught about betel quid chewing. Only 26% identified tobacco as an ingredient of the quid. 97% of participants suggested the habit should be discouraged through school health education. 57% felt that it was a doctor's and 86% a dentist's responsibility to tell patients about the risks of the habit.

Conclusions: medical and dental students have negative perceptions of the betel quid chewing habit. Dental students had received more education about the habit, and more training on examining the oral soft tissues than medical students. Many students did not recognize that tobacco is a component of the quid and its association with oral cancer. Students need more education about this dangerous habit.

Pattern of selling practices and awareness among vendors selling betel quid and areca in five districts of central Nepal* (Poster #16)

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Research objectives: Despite regulations like ban on advertisements; ban of sale to unlicensed vendors and minors etc; highest dependence rate of betel quid (39-43.5%) is reported in Nepal among six Asian countries. So, this is a pioneer pilot study to compare the various selling patterns and knowledge among the betel quid vendors and find its association with high prevalence.

Materials and methods: A questionnaire survey was carried in 5 urban districts of central Nepal among 125 vendors selling freshly prepared or packaged betel quid and areca products by two interviewers and rechecked the average data after a week to revalidate the data.

Results: 37.5% reported a sale of 50-100 freshly prepared betel quid per day; 48.3% sold 50-100 packaged areca products. 100% vendors displayed these products at point of sale. 48% of them were not aware of tobacco regulations. Despite being aware (72%) about ban of sale to minors; 96% still sold to minors. More than 70% were aware of the risk of tobacco to oral cancer but only 41.7% about betel quid. There was a strong association between the age group with awareness of the ban of sale to minor as well as number of working years with awareness of risks associated. Majority had "vendor" as the only primary source of income.

Conclusion: Growing prevalence of betel quid in Nepal maybe associated to vigorous sale and marketing at point of sale owing to the lack of awareness of the risk of betel quid to oral cancer and economic factors.

An approach to group cessation of betel nut and tobacco chewing—a case of eleven disadvantaged women in India* (Poster #17)

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The sample for the study was eleven women domestic help. Three of them were exclusive betel nut users while eight used mixture of tobacco and betel nut. They made their own quid, except for one who used Gutkha.

Having participated in a session on Healthy- Living on Gandhi Jayanti, they wanted to know more. We conducted a half-day session with them for detailed interactive discussion including their practice of betel nut and tobacco chewing.

Objective: Enabling betel nut and smokeless tobacco users to quit by intensive interactions to address their felt needs pushing them to use these products.

Intervention: Of the 5 days of intervention the first two days was for education on the harms of tobacco and betel nut chewing. Each of the remaining three days we addressed their problems of discord at home or work, zeroing on their chewing habit. They were not to feel deprived but were trained to push the chewing time forward more and more till they felt they did not need it. The discomfort was handled by mutual support, at times sucking on some rock sugar and drinking water. We had planned to meet them after two weeks. They could approach us earlier if needed.

When we met on the 15th day, eight of them had quit while two were contemplating and the remaining one had fallen sick. However, she wanted to try it all over again.

The conclusion is that quitting is feasible.

Use of betel quid (paan), arecanut and tobacco among women in a slum community in Mumbai, India* (Poster #18)

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Chewing betel leaf with arecanut/tobacco (paan/betel quid) is a widely accepted traditional practice among women from India. Betel quid is associated with oral cancers but women do not recognize health consequences. To develop appropriate prevention programs, formative research is required to understand how women use and explain their use of paan.

This paper uses survey data from a mixed methods study of smokeless tobacco (SLT) use in a representative sample of 409 SLT using women aged 18-40 years in a Mumbai slum community during 2010-2012.

Nearly half the women interviewed (48%) chewed paan with tobacco, and arecanut. Ninety percent of chewers belonged to Uttar Pradesh. Most women initiated post marriage (mean age 21.2 years) and 30% started during pregnancy to relieve gum problems. Half chewed 4 or more pan in a day, retaining quid in the mouth for more than 10 minutes; 25% swallowed their saliva. Seventy percent report suffering from food insecurity and 63% said it relieved hunger. Over 60% women agreed with positive reasons for chewing paan. Sixty percent were told to quit, and 40% tried to quit in the past year.

Chewing betel quid places poor women at increased risk of oral cancers. Use is culturally sanctioned and may substitute for food. There are no warning messages directed to paan use but there is both pressure and desire to quit use. Control programs must demystify the cultural benefits associated with paan use, educate women on harmful effects, promote anti paan norms, and identify ways of relieving hunger.

Predictors of tobacco use behavior and addiction among marginalized street children in Mumbai, India

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Background and Objective: Street children constitute a marginalized with transitory existence exposing them to harsh environments making them vulnerable to tobacco use and other substance abuse. A formative research study was undertaken to estimate tobacco use prevalence and factors influencing tobacco use behavior and addiction to develop tobacco use prevention and cessation interventions for this marginalized group.

Method: In a cross sectional survey 1671 street children with 1190 boys and 481 girls between 6 to 16 years were enumerated and interviewed through 11 non profit agencies working with marginalized children for care and support, in Mumbai, India.

Results: Overall 333 (20%) of street children reported tobacco use with mean age for initiation at 10.9 years with 49.2% (164) using smokeless tobacco. Illiterate children were more likely to consume tobacco than the ones who were receiving some informal education through the non profit agencies (OR 6.36; 95% CI 4.75-8.52; $p < 0.0001$). Also children with additional substance abuse (OR 3.06; 95% CI 2.33-4.01) and once with no contact with their families (OR 3.20; 95% CI 2.47-4.14; $p < 0.0001$) were more likely to use tobacco.

Conclusion: Study findings emphasize the need for effective strategies to target such marginalized unorganized high risk groups along with developing capacity in the service dimension of non profit agencies working with the marginalized children in promoting tobacco use prevention and designing suitable strategies for tobacco cessation interventions for these children with different vulnerabilities and needs.

Outcomes of providing tobacco treatment service to patients using betel quid through primary health care centers in urban India

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¹Narotam Sekhsaria Foundation, India

Objectives: To test the feasibility of implementing a counselor led tobacco treatment service provided to patients visiting a government primary healthcare center.

Materials and methods: LifeFirst, an intensive tobacco cessation service was provided by a trained counselor to patients visiting the outpatient department. The primary care center provides clinical and outreach services to slum population of about 65000 mainly consisting of migrant laborers. This involved providing brief advice using motivational interviewing to motivate patients to make a quit attempt, assisting quit attempt by providing behavior modification support and follow-up for six months over phone to maintain abstinence.

Results: Among 1490 tobacco users identified during the period November 2013 to December 2015, 165(11%) were users of betel quid with tobacco.66(40%) of these only used betel quid while the rest were poly users. All were provided brief advice and 153(93%) were willing to quit. Of these 138(90%) were willing to join LifeFirst service and 113(82%) actually enrolled. Of the 88 due for the 6th month follow-up, 34 were successfully followed. 40(45%) were lost to follow up due to unavailability or changes of phone numbers. At 6 month, 16 had quit and 10 had reduced use.

Conclusions: There is high intention to quit tobacco among patients and providing cessation support through a primary care setting may result in patient making a quit attempt and eventually quitting their habit. Although clinicians do not have the time and resources to provide intensive cessation service, cessation services provided by a trained counselor may be effective.

A symbol of connection between self and tribal home- Betel quid for Taiwanese aboriginal people* {Poster #13}

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Objective: This study aimed to understand the reasons of Taiwanese aboriginal people having habits of betel quid (BQ) chewing from the meanings in their culture and traditions.

Design: A descriptive qualitative design was approached. Ten regular BQ aboriginal chewers were included in this study. Data were collected by in-depth interviews with semi-structure guidelines and analyzed by qualitative content analysis following the process of open coding, naming, categorizing, meanings and themes.

Results: To most participants, BQ is associated with major footprints in one's life. In indigenous cultures, betel nut embodies the lasting companionship of a friend who stays true and loyal till the very end of one's life. The informants' experiences of chewing BQ were involved with the meanings of the following five themes: 1)BQ chewing helps reinforce self-identity and sense of belonging; 2) BQ plays a symbol of love and marriage in traditional culture; 3) BQ reflects celebration of simple abundance in indigenous life; 4)BQ chewing is for curing physical ailments and handling dental problems; 5)BQ is an attitude toward life accentuating the importance of learning to live in everlasting harmony with things in environment and nature.

Conclusions: The beliefs about BQ deeply impact aboriginal people on the attitude toward the chewing behavior. Since chewing BQ is the essential of indigenous Taiwanese culture, helping them away from the risk of developing oral-related cancers by designing the cessation or making policy need to concerned the important meanings of BQ in the culture.

Screening and Early Diagnosis of Oral Cancers

Pilot study on identification and pharmacokinetics of salivary biomarkers for betel nut and betel quid chewing* (Poster #21)

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Objectives: Betel chewing is carcinogenic and betel biomarkers are urgently needed for cessation studies. We studied: chemicals specific for 3 preparations commonly used in Guam: nut only (BN), nut+ Piper leaf (BL), and betel quid (BQ), compounds occurring in saliva during betel chewing, and salivary and urinary pharmacokinetics of betel compounds.

Methods: 5 chewers consumed each BN, BL or BQ. Baseline and post-chewing saliva was collected. 4 chewers consumed BQ and donated baseline and timed saliva, hair, and/or urine samples. Betel material was analyzed by HPLC. Saliva, urine, and hair were analyzed by LCMS. T-tests compared baseline and post-chewing samples; ANOVA compared differences between groups.

Results: Predominant alkaloids in betel material were arecoline and guvacolone. Nicotine predominated in tobacco. Chavibetol was found exclusively in Piper leaves. In saliva significant (<0.05) increases from baseline were observed for guvacine (BN, BQ), arecoline (BN, BL, BQ), guvacolone (BN), arecaidine (BN, BL, BQ), nicotine (BQ), and chavibetol (BL, BQ). Arecoline, guvacolone, guvacine, and arecaidine peaked 2 hours post-chewing then returned to baseline >8 hours. Salivary chavibetol peaked ~1 hour post-chewing. Urinary and salivary arecoline, guvacolone, and arecaidine patterns paralleled. Chavibetol glucuronide excretion paralleled salivary chavibetol. Betel compounds were not detected in scalp hair.

Conclusion: Promising biomarkers for BN and BL chewers are arecoline and guvacolone. Those compounds with chavibetol and possibly nicotine, cotinine, NNK, NNN, and NAT may identify BQ chewers. Betel exposure can be followed ≤8 hours post-chewing using the applied urinary and salivary betel specific biomarkers.

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Screening and early detection for Areca nut and betel quid related oral cancers* (Poster #22)

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In Bhutan Areca nut is the most commonly used form of addiction. Habit of chewing Areca nut has been in tradition since many years, used as food, medicine and for social and religious purposes. The Arecoline a principal alkaloid in Areca nut causes subjective effects of increased well-being, Alertness, stamina, mood lifting and increased concentration and relaxation. Betel quid with or without tobacco is a popular oral habit with potential links to the occurrence of oral cancer and various oral precancerous lesion and condition. As an early sign of damage to the oral mucosa, use of betel quid with or without tobacco often develops clinically visible whitish, reddish lesions and oral sub mucous fibrosis. These oral lesions are curable if detected early. One of the practical approaches to early detection of these cases is by oral visual examination using primary health workers. Three categories of lesions were detected

1. Stage 1: lesions for observation (homogenous and ulcerated leukoplakia)
2. Stage 2: lesions for investigation (oral sub mucous Fibrosis)
3. Stage 3: lesions for treatment (cancers)

Oral Potential Malignant Lesions Screening Among Administrative Staff in Faculty of Dentistry, Universities Padjadjaran, Indonesia* (Poster #23)

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The use of tobacco and betel quid are well established risk factors for oral cancer. Indonesia has a large number of smokers and betel quid users. Because early detection of cancer greatly increases the chances for successful treatment and better prognosis, our study was focussed on detection of oral potentially malignant lesions (OPML) and their correlation with oral cancer risk factors. Specifically, we undertook a screening among administrative staff of Faculty of Dentistry, Universitas Padjadjaran, Indonesia. We hypothesised that these staff members may be at higher risk because they are perceived to habitually smoke during work.

The study was descriptive-cross sectional. We did clinical assessment utilizing white light for intra oral examination to find any alteration such as changes of colour and texture, swelling, and/ or ulceration as well as extra oral examination on head and neck. Questionnaire was given to determine the oral cancer risk factors.

There were 32 respondents (6 females and 26 males) with an age range between 20 and 60. 16 (50%) respondents had leukoplakia, of whom 11 were smokers and 4 were both smokers and alcohol drinkers. None of the respondents were betel quid users. Another 16 respondents who revealed normal oral mucosa did not have any risk factors behaviour.

Our results clearly show that the number of OPML among administrative staff is high. This might be due to their low awareness towards oral cancer risk factors, however further research is needed to confirm this hypothesis.

Screening studies on oral cancer and potentially malignant disorders in Sri Lanka* (Poster #24)

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Pioneering oral cancer screening studies were conducted in Sri Lanka by Warnakulasuriya and Nanayakkara during 1980s. The first (Warnakulasuriya et al 1984), was a feasibility study employing Primary Health Care Workers (PHCW) in the Central Province. Close to 30,000 were screened reporting a sensitivity 0.95, a specificity 0.81, PPV 0.58 and NPV 0.98.

Warnakulasuriya and Nanayakkara then reported the reproducibility of this screening technique using the same PHCW model in the Galle Province. 57124 were screened detecting 20 cancers and 1716 precancers with a sensitivity 95-97 percent and specificity 75 - 81 percent, well within the data reported from the UK, Japan and India. There were three other screening studies conducted in Sri Lanka during the last 10 years; two were among the estate workers.

Based on these screening data Amarasinghe et al proposed a risk factor model (RFM) to pre-select subjects for screening based on their life style habits (Betel quid and alcohol use). In this RFM betel quid use scored the highest risk for developing cancer. Targeted screening of subjects who are at high risk for

oral cancer due to tobacco, alcohol and betel quid use could maximize the screening efficiency as well as contribute to reduction of mortality from oral cancer.

Risk Factor Model gives a clear definition of patients at high risk for oral cancer in Sri Lanka. Our PHCW model was tested and found suitable for oral cancer screening studies in other low and middle income countries.

Oral Cancer Screening among Tobacco users in Hpa-An, Kayin State, Myanmar* (Poster #25)

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Dental professional has a key role in the prevention of oral cancer by early detection of any suspicious oral lesions. The purpose of the study is to evaluate the various forms of tobacco usage and the occurrence of oral lesions among the people living in Hpa An, Kayin State. In this study, 337 participants were underwent for oral screening and 73 participants had various type oral habits. Male:female ratio was 1:1.5. Commonest oral habits were chewing betel quid alone (69.8%) followed by chewing & smoking(12.32%), chewing, smoking and drinking(9.5%), smoking alone(4.1%), smoking&drinking(2.7%) and chewing&drinking(1.3%) respectively. On examination, 19 out of 73 had cherner mucosa (26.02%) and 12 out of 73 had suspicious oral lesions(16.44%). After conducting toluidine blue staining, 7 out of 12 suspicious cases were toluidine blue stain positive. 6 cases were underwent for oral brush biopsy and excisional biopsy was done in one case. One case did excisional biopsy along with oral brush biopsy. Epithelial dysplasia were found in 6 cases and histological examination of excisional biopsy was compatible with oral squamous cell carcinoma (well differentiated). Collectively, among the tobacco users(n=73), 6 cases of oral potentially malignant disorders and one oral squamous cell carcinoma were detected (~10.1%). Oral cancer screening at Kayin State Hospital showed effectiveness of oral screening among high risk group for detection of suspicious oral lesions. Therefore, detrimental effect of smokeless and smoking tobacco was significantly involved in the causative factors of OPMDs and oral cancer.

Cross sectional study of smokeless tobacco addictions and its effects on oral health in tribal population and comparison with non-tribal control population* (Poster #26)

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Background: Tobacco chewing and use of tobacco related products is a social norm in Tribal population in Gadchiroli district of Maharashtra state of India. The addiction consequences of this largely ignorant population are further complicated by limited access to basic health care and education.

Objectives: To find the prevalence of tobacco addiction in tribal villages. Screening and Early Detection for Areca Nut and Betel Quid- Related Cancers in the tribal population. Long term objectives being health education, de-addiction and prevention of oral cancer by detecting precancer at early stage.

Methods: Tribal villages were identified in the Gadchiroli district where tribal population according to 2011 census was nearly 100%. A cross sectional data was obtained from these villages by conducting camps and house to house surveys.

Result: 450 tribal individuals were screened out of which 349 were habituated to smokeless tobacco. 124 patients were suffering from oral pre cancer. 534 individuals from non tribal rural population were

screened out of which 211 were habituated to tobacco with 116 individuals suffering from oral pre cancer. 1 patient diagnosed with advanced oral squamous cell carcinoma. High prevalence of smokeless tobacco use especially, 'Kharra' was observed in tribal children starting at the age of 3 yrs. Health education and advice was given for de-addiction to 560 individuals.

Conclusion: Tobacco habits associated oral cancer are more prevalent in tribal population as compared to non-tribal rural population which warrants strong tobacco control measures.

Epidemiology of betel quid chewing in Taiwan and its policy implications* (Poster #27)

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Oral cancer increased 10-fold in incidence, jumping from 550 to 6,000 cases a year, and 6-fold in mortality in the last two decades. Betel quid (BQ) chewers are breadwinners in the lower socioeconomic class, and, with most chewers smokers, chewing worsened the health disparity and led to 18,000 deaths every year from chewing BQ.

Taiwan earned the unenviable reputation as the world leader in oral cancer, and for age 30-54, the leading cancer among all cancer sites. The onslaught, with 30-40 combined oral assaults every day, 15-20 cigarettes and 15 BQ per day, by nearly 2 million adults, has been a public health disaster. The life time oral cancer risk, 42%, is nearly 40 times larger than U.S., at 1.08%, but cancer risk of BQ is systemic, inflicting organs far beyond oral cancer.

Enacting the "betel quid control act" is urgently needed, by modeled after the "MPOWER" approach for both tobacco and BQ. Quitting smoking led to BQ cessation, but not vice versa. Collect BQ consumption and sales data for "Monitoring", publicize the chewing harms for "Protect", offer cessation services for "Offering", place warning pictures on package for "Warning", ban advertisement for "Enforcing", and increase the tax of BQ for "Raise". Barriers to BQ control include unawareness of its harms, the powerful interest groups, and the lack of political commitment. An IOM-like white paper report is needed, but an urgent call for the international community to offer assistance should also be made, including an endgame toward BQ sale and chewing.

A Community-Engaged Approach to develop a South Asian Smokeless Tobacco Product Research and Policy Blueprint for the U.S.* (Poster #28)

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Research Objectives: There is a data gap on U.S. South Asian tobacco product availability, use and cessation. To address this and other S. Asian health research gaps, we developed the NIMHD-funded South Asian Health: From Research to Practice and Policy (1R13 HD007147-01A1).

Methods: We engaged multidisciplinary researchers, community members, policy makers, and practitioners to foster sustained community-academic collaboration and develop a U.S. South Asian tobacco product research and practice translational research blueprint. Virtual working groups reviewed and catalogued the available evidence, identified data gaps, and solicited community research priorities. Research priority recommendations were made, followed by a one day invitational convening (comprised of 50 U.S. Canadian, and S.Asian experts) to synthesize and expand upon the preliminary report. Five post-conference community town hall meetings extended the conference's community interactions.

Results:

Key findings:

- Surveillance systems of alternative tobacco product (ATP) availability (type, amount, location) and use among all ages in the U.S. are not standardized.
- There is a general lack of knowledge and awareness of ATP metabolic and carcinogenic risks.
- There are no available South Asian-specific ATP cessation protocols or trainings in the U.S.
- Product regulation (especially online) is lacking in the U.S., to the community's detriment.

Conclusions: More research is needed on ATP availability, accessibility, labeling, importation, and sales to minors. Prevention initiatives should start with youth, particularly susceptible to ATP use. Local ATP policies in areas with large, growing SA communities should be explored. Community and religious/cultural leaders should be engaged for information dissemination and improved messaging.

Betel quid and areca nut use in India: An in-depth review of numerous products made and policy analysis of ban on ST products for covering these products* (Poster #29)

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Background: Significant gaps persist in information available in different reports and monographs on multitude of smokeless tobacco products available in India.

The objective of this research is to conduct an in-depth study of all possible sources to adequately describe each product, especially those with betel quid or areca nut.

Beginning 2012, different Indian states banned ST products to varying extent. Second objective is to analyze if tobacco products with Betel quid and areca nut are covered adequately by this ban.

Methods: in addition to journal articles, unconventional resources like websites of manufacturers and sellers, newspaper articles, youtube videos, movies, package inserts and litigations were searched for information on ingredients, their processing, methods of use and prevalence.

Also, notifications by 30 State Governments banning ST products were obtained from their websites.

Results: Betel quid with tobacco, Gutka, Kharra, Mainpuri, Dohra, Mawa and 'Pan Masala with zarda sold in separate pouches' have betel quid and/or areca nut. Gutka used by 8% adults is most popular product among adolescents.

Betel quid finds no mention in any notification. Only Maharashtra bans arecanut explicitly. All states primarily ban Gutka and Pan Masala containing tobacco. Upto 11 states have blanket ban on all ST products, depending on how notification is interpreted. Barring 1-2 states, products like Kharra and Mawa find no explicit mention. Also, being made by unorganized street vendors, they largely escape ban.

Conclusion: Despite ban on ST products by different state government, huge gaps in product coverage remain, practically nullifying the impact.

Research Focus on Betel Nut by the University of Hawaii Cancer Center/University of Guam Partnership: An Overview* (Poster #30)

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In 2003, the University of Hawaii Cancer Center and the University of Guam initiated an institutional partnership to address cancer health disparities in Pacific Islanders. In 2007, a first research project on betel nut to develop a tool to assess betel chewing (M.J. Miller, S. Murphy) was funded. Subsequently, multiple betel nut research projects were conducted: isolation and quantification of Areca alkaloids (N.K. Suleman, T. Wright); an epidemiological study of oral precancerous lesions and other health risks in chewers (M.J. Miller, Y. Paulino, S. Murphy, E. Hurwitz); identification of sociocultural factors affecting betel nut chewing in Guam (K. Murphy, J. Moss, T. Herzog); identification of Areca nut components involved in pro-inflammatory mechanisms (N.K. Suleman, T. Wright, R. Penner); identification of salivary biomarkers for betel nut consumption (A. Mendez, C. Cabading, A. Franke); the influence of betel nut chewing on the oral microbiome (Y. Paulino, M.T. Goodman, B.Y. Hernandez). Current studies aim to structurally identify molecular components of betel nut involved in carcinogenesis (J. Yang, W. Jia, P. Williams, R. Penner), and to conduct a first betel nut intervention trial in Guam and Saipan (Y. Paulino, J. Moss, C. Cabading, A. Franke, P. Pokhrel, T. Herzog). Given the paucity of betel nut research in the United States, and its relevance for both our region and internationally, we intend to continue our research emphasis on betel nut, and to make our two institutions a major center for betel nut research in the United States. Supported by NCI grants U56CA096254, U56CA096278, U54CA143727, U54CA143728.

Countering a lethal combination: Mobilizing communities in Solomon Islands for betel nut and tobacco control* (Poster #31)

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Objectives and materials: Betel nut and tobacco are the main cause of oral cancer in Solomon Islands. Responding to the increasing frequency of betel nut use, WHO Regional Office for the Western Pacific (WPRO), in 2012, published *A Review of Areca (Betel) Nut and Tobacco Use in the Pacific*, offering a framework for action to address both supply and demand for betel nut and tobacco products. To stimulate community mobilization, the Tobacco Free Initiative, WPRO supported production of a video documentary in Solomon Islands and developed an accompanying discussion guide and action planning toolkit.

Methods: The pilot test of the materials was conducted with a focus group comprising 15 residents of Honiara in 2014. Participants viewed segments of the documentary and engaged in guided discussion about the situation and potential action areas using the discussion guide. This was followed by a short action planning workshop, based on the WHO framework for action.

Results and conclusions: Participants highlighted the need to de-normalize betel nut and tobacco use as paramount. Enforcement of laws to decrease affordability and accessibility such as banning the sale of betel nut and tobacco to minors and the sale of loose cigarettes was an identified gap. Likewise, participants identified the need to strengthen collaboration among government agencies, municipalities and civil society in order to support de-normalization of betel nut and tobacco use. This project,

designed to be adapted by other countries experiencing a similar issue, is currently being replicated in two Pacific countries.

It is high-time for WHO & Asian Countries to create a FCAC (Framework Convention on Arecanut Control) – on the lines of FCTC – to control & reduce the supply and demand of Arecanut-based-Products

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Background: According to FAO, total-area under Arecanut-Crop in the world is 468,316 Hectares, producing 593,275 Tonnes – with major-contributions from India, Indonesia, China, Bangladesh, Myanmar, Thailand & Malaysia. IARC's Research concluded that chewing arecanut is carcinogenic to humans. Arecanut affects almost all organs of human-body, including brain, heart, lungs, mouth & reproductive organs – irrespective of age, gender, color, ethnicity & country.

Objectives: To awaken WHO & Asian-Countries – to initiate efforts to formulate a FRAMEWORK CONVENTION ON ARECANUT CONTROL (FCAC), on the lines of FCTC – to control & reduce supply and demand of Arecanut-based-Products, across-the-Globe.

Methods: Ignoring the cascading-harmful-effects of Arecanut, Indian Government (Ministry of Agriculture) has set up a Directorate of Arecanut Development - with a Mandate for developing Arecanut. – in association with 43 Agricultural-Universities, Indian Council of Agricultural Research – with an outlay of INR 110,000,000 during 2015-16.

In 2001, India cultivated Arecanut in 341,000 Hectares producing 403,000 Tonnes-- whereas in 2013, production got almost doubled and stood at 730,000 Tonnes obtained from 445 Hectares. Likewise, all Asian Countries are vying with each other to exponentially-promote this product and develop more-and-more new products based-on-Arecanut. CFTRI(Mysore-India) even developed a soft-drink-concentrate called Pan-Supari-Nectar.

Hence it is high-time for WHO & Asian Countries to formulate a FRAMEWORK CONVENTION ON ARECANUT CONTROL (FCAC) – on the lines of FCTC – to control & reduce the supply and demand of Arecanut-based-Products.

Conclusion: To start with, WHO may focus to implement FCAC in all Asian-Countries within 2020.

Policy and Economic Impacts of Betel Quid and Areca Nut Use in Nepal – An Exploratory Study* (Poster #32)

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This study will be the basis of policy and will stimulate research in economics of Betel Quid and Areca Nut Use in Nepal. Literature on smokeless tobacco products which contain areca nut and betel leaf/ root have been reviewed and also field data on the their use have been collected. Nepal Demographic and Health Survey and trade, tax and revenue related data have been analysed. No data is available on the use of Betel Quid and Areca Nut per se but their use in the forms of SLT was estimated at 4.7% among women aged 15-49 in 2011 and 34.8% among men. Areca nut is grown in Nepal and until recently SLT products were produced at home but now big companies in Nepal and India are taking them over and

marketing them. Excise, VAT and import duty are levied on Betel leaves, roots, and Areca Nuts but they constitute less than 1% of total import revenue. Recently SLT excise has increased from 1% in 2010/11 to 25% by 2014/15. Until 1995/96 import of SLT products was non-existent but since 1996/97 it has increased substantially. Smuggling of areca nuts and SLT products has been going on for years. A cheap SLT product such as Gutkha is a good substitute for cigarettes. Using available data it was found that SLT is price-inelastic. However, the estimate was subject to limitations due to lack of appropriate data. Nepal needs to follow WHO recommended guidelines to formulate areca nut and SLT control policy.