

出國報告（出國類別：會議）

出席歐盟執委會人道救援暨公民保護署「大量燒傷患災後應變」研討會

服務機關：衛生福利部醫事司

姓名職稱：王宗曦司長

派赴國家：比利時

出國期間：105年5月25日至26日

報告日期：105年7月27日

行政院及所屬各機關出國報告提要

報告名稱：出席歐盟執委會人道救援暨公民保護署「大量燒傷患災後應變
(Dealing with mass burn casualty disasters)」研討會

出國計畫主辦機關：衛生福利部

出國人：衛生福利部醫事司 王宗曦司長

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出國期間：105年5月25日至105年5月26日

出國地區：比利時

報告日期：105年7月27日

內容摘要：

本人於105年5月25日至26日赴比利時布魯塞爾，參加由歐執委會人道救援暨公民保護總署(DG ECHO)所籌辦之「大量燒傷患災後應變(Dealing with mass burn casualty disasters)」研討會，分享去年我國發生「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得，率台大醫院整形外科戴主任浩志及林口長庚醫院整形外科楊教授瑞永，協同應邀出席該研討會。

會議中我團向各歐盟與會專家陳述去年「八仙樂園粉塵暴燃事件」之處理始末，於事件發生初期透過區域緊急醫療應變中心(Regional Emergency Medical Operation Centers, REMOC)掌握傷患人數，並透過定期會議型式整合醫療資訊，進行醫療資源調度。各國專家對我國處理八仙樂園塵爆事件，在未對外求援下，全力救治近500名燒燙傷病患，死亡率僅3%之成功應變作為至表感佩。法國籍講者Percy Military Hospital燒燙傷部主任Thomas LECLERC及比利時籍講者布魯塞爾燒燙傷科主任Serge JENNES會後特別向我專家致意，以「極為驚人」(extremely amazing)讚揚我國成就。未來台灣將成立一整合型國家型皮膚保存庫，預計今年申請、明年取得美國組織銀行(AATB)認證，後續擬積極與歐盟合作鏈結相關品質管理機制。DG ECHO公民保護政策處Hans DAS處長會中多次肯定我團貢獻，並於會後表示，盼持續合作。我團於會議中竭誠邀請歐盟國家蒞臨明(106)年4月1日至4日在台北舉辦之「第11屆亞太燒燙傷大會」，歐方回應為有關明年將於台灣舉辦的亞太燒燙傷會議，將協助轉達訊息給歐盟各會員國知悉。後續歐盟如有召開燒燙傷相關研討會議，亦將再邀請台灣參與。研討會十分尊重台灣，不僅為我國正名「TAIWAN」，還擺上國旗。我團全程參與各項討論，

亦能瞭解歐洲國家針對類似事件之經驗、緊急應變規畫及收治傷患能量，助我提升台灣先進醫療水準於歐洲之能見度，各方收穫均豐。

報告大綱

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壹、 目的

一、 緣起

我國八仙樂園是北台灣著名的水上遊樂園，也是東南亞最大的水上樂園，迄今遊客總數超過七百萬人次，104 年舉辦「Color Play Asia 彩色派對」活動，號稱為全亞洲最大的彩色派對，由歌手演唱及活動並噴灑彩色粉末，事發當日天氣晴朗，適逢暑假期間與周末，吸引了許多學生與年輕民眾參加，當日估計超過 4,000 人參加，活動現場估計約 600 人，活動過程估計噴灑了 3 噸色粉。為了增加舞臺效果，使用二氧化碳鋼瓶向舞臺下民眾噴出大量色粉，舞台上的電燈溫度高達 1,250°C，色粉被燈具上的散熱抽風扇吸入後，在燈內起火火舌再由排風口竄出，引發全場大火，舞台由泳池抽乾後搭建，地形導致逃生困難，參加活動民眾穿著泳衣或短袖衣物，色粉沾黏於皮膚上燃燒後，造成大面積燒燙傷，積粉高達 5 公分，逃生過程中又使色粉揚起造成再次燃燒。

新北市消防局於事發後 5 分接獲報案通知後，即預期有逾百名的嚴重傷患，立即通知消防署與相關單位啟動大量傷患應變機制，15 分後抵達現場成立初期救護站，新北市政府接獲通知後立即成立應變中心，調度新北市與台北市 5 家醫院，8 組醫護人員至現場成立救護站，並調度中、大型巴士等各式車輛前往，以協助現場大量傷病患的醫療後送與分流，另通知相關急救責任醫院即早準備，衛生福利部接獲通知即刻啟動大量傷病患機制，連絡鄰近衛生局通知所轄醫院全面整備收治，並協調民間救護車業者支援，在各單位努力之下，事發 4 小時內，已將傷患全數送往醫院，最後一名傷患也在 6 小時內抵達醫院。隔日上午行政院隨即成立 0627 專案小組，整合跨域、跨部會、政府與民間量能，全力協助傷患及家屬。

查本次事件總收治醫院共 54 家，傷患年紀多集中於 30 歲以下的年輕人，30 歲以下傷患共 459 人約占 92%，參加活動民眾大多穿著泳衣或短袖衣物，因此下半身灼傷之燒燙傷患者共有 415 位占 83%，其次為上肢灼傷 320 位占 64%，本次事件共有 499 名傷患，有 281 人(占 56%)燒傷面積超過 40%，其中 41 人(占 8%)超過 80%，本次事件之傷患有 334 人(近 70%)為三級燒傷。統計至 105 年 5 月 5 日止，死亡 15 人，5 人尚在住院治療中，479 人出院，大部分病患皆於 104 年 12 月以前出院，出院(存活)率約為 96%。國內外各界人士與媒體對於本事件發生當下即投入高度關注，就八仙塵暴事件平均燒傷面積

41%，平均年紀 23 歲來計算，不論有無吸入性嗆傷，平均致死率應該高達 64% 以上，而在我國政府與醫界全力動員的全力救治之下，死亡人數降至 15 人，整體死亡率只有 3%，遠低於事前的預測，而且已經有 479 位病患平安出院，所創造的醫療奇蹟，不僅獲得全球醫界高度讚揚，歐執委會人道救援暨公民保護總署(DG ECHO)更邀請本人參加「大量燒傷患災後應變(Dealing with mass burn casualty disasters)」研討會，分享「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得。

二、 會議重點摘要

本人於 105 年 5 月 25 日至 26 日赴比利時布魯塞爾，參加由歐執委會人道救援暨公民保護總署(DG ECHO) 所舉辦之「大量燒傷患災後應變(Dealing with mass burn casualty disasters)」研討會，會中規劃我專家簡報時間為 30 分鐘，後續更開放 15 分鐘之提問時間(Q & A)，分享去年我國發生「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得，各國專家對我國處理八仙樂園塵爆事件，在尚無對外求援下，於事件發生初期透過區域緊急醫療應變中心 (Regional Emergency Medical Operation Centers, REMOC) 掌握傷患人數，並透過定期會議型式整合醫療資訊，進行醫療資源調度，全力救治進 500 名燒燙傷病患，死亡率僅 3%之成功應變作為至表感佩。

我團應歐盟執委會人道救援暨公民保護署(DG ECHO)之請進一步講述內容，包含：(1)在未移送第三國協助救治情況下，如何於短時間內收治大量傷患？他國醫事人員協助情形為何、(2)我國動員醫事人員之策略、(3)醫療用品之提供狀況、向第三國採購情形及是否有相關預擬規劃，及(4)是否展開針對此一案例之研究計畫等四大項問題。將我團專家視為研討會主角，所出席專家充分發言並提出建議或未來合作方向。

三、 目的

(一) 分享「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得。

(二) 參訪比利時 Reine Astrid 軍醫院附設皮膚庫，成為台灣未來整合成立國家型皮膚保存庫之借鏡。

(三) 拜會歐盟執委會國際合作發展總署國際合作發展司，就台灣與歐盟在醫療領域進行合作事宜交換意見。

貳、 議程表

European Medical Corps
Workshop on "Dealing with mass burn casualty disasters"
25 May: 13:00-18:00 and 26 May: 9:00-13.00
Charlemagne building, Room Sicco Mansholt, European Commission,
Rue de la Loi 170, B-1000, Brussels

DRAFT AGENDA

The Charlemagne building has a strict security regime. Only registered participants will be admitted. Security checks may take up to 20 minutes.

25 May 2016

13:00 - 13:30	Arrival of Participants (security and registration – welcome coffee)
13:30 - 15:40	Setting the scene: Welcome remarks by Mr. Hans DAS, Head of the Civil Protection Policy Unit, DG Humanitarian Aid and Civil Protection (ECHO), European Commission.
	Romania: Key challenges and lessons from the Colectiv club fire accident, 30 October 2015 Belgium: The national system for dealing with burns victims and lessons from mass casualty disasters Sweden: The national system for dealing with burns victims in case of mass casualty disasters & Specialised Aerial Medical Evacuation assets Q & A
15:40 - 16:00	Coffee Break

16:00 - 17:00	<p>Taiwan: Key challenges and lessons from dealing with the impact of the water park explosion on 29 June 2015</p> <p>Australia: The national burns plan and lessons from mass casualty disasters</p> <p>Q&A</p>
17:00 - 18:30	<p>Exchange of views on the main challenges</p> <p>Participants will be invited to exchange views on a number of questions (see “Main topics for discussion” attached), including: What are the main challenges?</p> <p>Is there scope to develop EU cooperation in this area? Would it be interesting to develop arrangements to better pool existing capacities? Which preparations are required to make transfers of patients possible? Can mobile teams of specialists be designed? Are there specific challenges in the area of medevac?</p>
17:00 - 18:30	Networking dinner

26 May 2016

09:00 - 09:30	Arrival of Participants (security and registration – welcome coffee)
09:30 - 10:10	<p>The Netherlands: The national system for dealing with burns victims and lessons from mass casualty disasters</p> <p>Q& A</p>
10:10 - 12:20	<p>Final discussion on the way forward</p> <p>Which follow -up actions can be envisaged within</p>

	the UCPM or EMC framework or through other instruments?
12:20 - 12:30	Conclusions

參、 會議過程實記

一、 報告內容節錄

歐執委會人道救援暨公民保護總署(DG ECHO) 於 105 年 5 月 25 日至 26 日在比利時布魯塞爾，舉辦「大量燒傷患災後應變(Dealing with mass burn casualty disasters)」研討會，計有歐盟 19 個會員國、挪威、亞塞拜然及我國共 22 國及世界衛生組織約 40 位專家與會。本人會同台大醫院整形外科戴主任浩志及林口長庚醫院整形外科楊教授瑞永 3 人應邀出席，分享去年我國發生「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得，分享以下關鍵性作為：

(一)、即時啟動傷患救治策略

新北市消防局於事發後 5 分鐘接獲報案，立即通知消防署與相關單位啟動大量傷患應變機制，15 分後抵達現場成立初期救護站，新北市政府接獲通知後立即成立應變中心，調度新北市與台北市 5 家醫院，8 組醫護人員至現場成立救護站，並協助現場大量傷病患的醫療後送與分流，及通知相關急救責任醫院及早準備。衛生福利部啟動大量傷病患機制，連絡鄰近衛生局通知所轄醫院全面整備收治，並協調民間救護車業者支援，在各單位努力之下，事發 4 小時內，已將傷患全數送往醫院，最後一名傷患也在 6 小時內抵達醫院。隔日上午行政院立即成立 0627 專案小組，整合跨領域、跨部會、政府與民間量能，全力協助傷患及家屬。

解決燒燙傷病床不足策略：大部份醫院都為收治傷患，主動將加護病房改裝為臨時燒傷病房，例如：振興醫院改裝加護病房 6 床為燒傷加護病床、新光醫院改裝 1/2 外科加護病房為燒傷加護病床並改裝一般病房為燒傷病房。改裝病床如符合規格，且為本次事件病人入住之病床，完成核備程序後，比照燒傷病房支付健保費用。

人力調度策略：各醫院已動員數以千計的醫事人員極力搶救病患生命，衛生福利部與醫師公會全聯會及護理師公會全聯會合作規劃醫護支援人力平台，適時調度人力以避免醫護人員過勞。透過健保署與 6 區 REMOC 每日調查各醫院人力需求，並利用健保 VPN 系統收集傷病患資訊，以主動協助醫院，透過醫、護學會招募各類醫護支援人力、簡化地方衛生局報備支援流程、各醫院可自主調度院內或退休人員或利用平台媒合支援人力，以提供此次大量

傷病患醫療照護。本次事件各醫院透過內部調度與志願支援人力平台，成功動員約 16,000 人的支援醫護人力。

燒燙傷藥品醫材調度策略：本次八仙粉塵暴燃事件傷者多為大面積灼傷，以當時燒傷總面積百分比估算，大體皮膚的需求量遠遠高於國內現有庫存，故急需自國外進口大體皮膚等敷料，供醫療救治使用，每次配送量則以需求醫院之傷者燒傷總面積按比率計算分配數，並配合各醫院清瘡與自體皮膚移植手術量，請整形外科醫學會等醫師進行專業微調，食藥署總共進口國外大體皮膚 70 萬 cm²，已使用 57.16 萬 cm²，未使用之大體皮膚已分配至全國 11 家建置皮庫的燒燙傷中心。另於事件發生後，國內外均有團體捐贈各項醫療物資，食藥署成立「八仙塵爆事件醫療捐贈物資調度系統」資訊平台，彙整各界捐贈之藥品、醫療器材及大體皮膚等醫療物資，並自動發送電子郵件給需求醫院及捐贈廠商進行媒合，以利相關物資有效運用。

(二)、匯集國內外醫療能量

本次八仙事件，政府全力支援經費，讓醫院無後顧之憂，全力搶救病人，前行政院在事件第 5 日即宣布，全力支援經費，動支行政院第二預備金辦理「辛勞津貼、大體皮膚採購、輔具購置、個案關懷」生活重建，共計支出 15.3 百萬歐元，全部醫療費用由健保或政府支出，全民健保支出門急診與住院等各項健保可以給付的醫療費用 15.8 百萬歐元，非全民健保給付的自費項目，也由捐款等其他經費支應，讓家屬沒有後顧之憂，共計支出 3.5 百萬歐元，全部支出費用達到 35.6 百萬歐元，有關政府預備金，主要支付醫事人員辛勞津貼，共計補助 11.8 百萬歐元，其中以醫師所占比例 61%最高。同時，國內消防、醫療、社工人力總動員，消防體系在前 12 小時就動員了 1235 人，救護車 144 車次，其他輔助車輛 143 車次，醫療體系在第一個月內至少動員了 1860 位醫師、1936 位護理師與 2000 位其他醫事人力，社工也立即啟動關懷慰問機制，動員 7478 人次的地方社工、15168 人次的醫院社工，提供案家關懷訪視、即時諮詢、資源連結及轉介等服務，迄今慰問與關懷近 8 萬人次，醫療與社工在事發初期開始合作，「一人一案，長期陪伴」，提供全方位的生理、心理、社會、家庭、就學/業、法律等面向之服務。

日本醫療團交流：八仙塵爆事件發生後，國際社會不僅關注，更不吝惜伸出援手。6 名具重症醫學領域及燒燙傷處理專業背景之教授與醫師：由台灣路竹會及中華民國醫師公會全國聯合會促成、由亞洲醫師會及日本醫師會

共同推薦醫療團代表，至三軍總醫院、新光醫院、振興醫院、林口長庚、國泰醫院等收治八仙燒傷病患之重點醫療院所進行專業醫療交流，醫院訪視人數(三度燒傷以上人數)：三軍總醫院(35 人)、新光醫院(33 人)、振興醫院(17 人)、林口長庚(22 人)、國泰醫院(15 人)，日本醫療隊與醫院就傷患之臨床處理，進行經驗分享與意見交流。其諮詢與討論內容主要針對治療原則、醫事技術交流、醫療資源分配優先原則、傷口感染預防注意事項與感染治療經驗分享，均於現場進行完整的意見交換與討論。日本醫療團表示，臺灣的醫療水準高，本次來臺除了進行醫療交流，也希望了解臺灣本次事件之處理經驗，作為日方未來相關規畫之參考，並對臺灣於短時間內完成收治與處理傷患之緊急應變能力表示敬佩，並且強調，燒傷病患的治療是相當昂貴且漫長，沒有政府的支持與資源投入，很難達成目標。

美國醫療團交流：美國著名的約翰霍普金斯 (Johns Hopkins) 大學醫學院燒燙傷中心，在七月初就主動與我國駐美代表處聯繫，表示願意提供協助。經由我國外交部的促成，於我國總統出訪回程過境美國洛杉磯時，邀請該中心的醫療團隊搭乘總統專機回臺，該團隊由燒燙傷中心主任重建整形外科教授 Stephen M. Milner 領軍，六位成員專長領域涵蓋緊急醫療、燒燙傷外科、麻醉和危重病急救、職能治療等等。抵達台灣當日，醫療團即刻至台北馬偕醫院探視八仙塵暴的美籍傷患，於停留的七天內走訪了 12 家醫院，了解八仙塵爆傷患的治療情形；以系統性觀點因應及處理大規模災難事件，從病患運送、資源分配、醫療優先順序等，找出最適合處理措施，並不斷從中汲取經驗，提醒注意抗藥性潛在問題的發生，也建議宜特別留意黴菌感染之預防。

(三)、後續發展

本事件適逢暑假期間與周末，吸引了許多學生與年輕民眾參加，因此傷患年紀多集中於 30 歲以下的年輕人，30 歲以下傷患共 459 人約占 92%，參加活動民眾大多穿著泳衣或短袖衣物，因此下半身灼傷之燒燙傷患者共有 415 位占 83%，其次為上肢灼傷 320 位占 64%，本次事件共有 499 名傷患，有 281 人(占 56%)燒傷面積超過 40%，其中 41 人(占 8%)超過 80%，本次事件之傷患有 334 人(近 70%)為三級燒傷。本事件統計至 2016/5/5，死亡 15 人，大部分病患皆於 104 年 12 日出院，出院(存活)率約為 96%，原本依據 Baux score 來估算，八仙塵暴事件平均燒傷面積 41%，平均年紀 23 歲來計算，不論有無吸入性嗆傷，平均致死率應該高達 64%以上。但是在我國醫界的全力

救治下，死亡人數只有 15 人，整體死亡率只有 3%，遠低於事前的預測，而且已經有 479 位病患平安出院，實為我國政府與醫界全力動員，共同努力之下，所創造的醫療奇蹟。

同時，為因應八仙塵暴事件後續照護所需，強化醫事人員之教育訓練，增進其專業知能，以提高醫療服務水準，加強辦理「培育醫事人員出國進修實施計畫」，補助 8 名醫師、護理師、藥師、營養師等前往美國及日本進修燒燙傷口照護、復健、手術室藥局、重症營養照護等課程；1 名醫師至日本國立長壽研究中心研究在宅醫療運作、3 名護理師至京都大學附設醫院進修燒燙傷口照護、2 名藥師至廣島大學附屬病院研習手術室藥局設立及運作觀摩。同時，更強化傷燙傷病患復健及社區服務的介入，舉辦 3 場「物理治療與職能治療人員培訓」課程，共計 600 人參加；10 場「訓練研討會及技術實作工作坊」，共計 294 人參與。除了建立臨床指引及患者功能預後評估工具，也發展出臨床照護衛教手冊 6 本，陸續辦理居家物理治療及職能治療訪視服務、病友支持團體活動，並將持續辦理，陪伴後續漫長的復健過程。

除上述本部因應措施之外，我國行政院於事件發生後第二日宣布，在彩色粉末安全性未確定前，公共活動全部禁止使用，另，為提升觀光旅遊地區與大型活動之安全，行政院、內政部、交通部觀光局，分別於 2015 年 11 至 12 月核定「大型活動安全管理方案」、函頒「大型群聚活動安全管理要點」、修正「觀光遊樂業管理規則」，強化觀光旅遊地區主管機關(構)或活動舉辦單位應備有相關作為，強化其公共責任。每年針對觀光遊樂業者辦理督導考核，積極要求觀光遊樂業者，應置有緊急救護計畫(包含救護站、救護人員、救護設備等)，如有事件發生，於消防機關救護車未抵達之前，應有初步緊急救護作為，平時應舉辦大量傷病患緊急救護暨救難演習。為確保活動安全及維護消費者權益，金融監督管理委員會建議各級主管機關應規範舉辦活動之業者提交活動計畫書並落實風險管理，且建議業者於營業場所內或活動場地明顯處，向消費者揭露已投保公共意外責任保險，並將保險額度提高。

二、 會中交流

本次研討會各方交流議題包括：「羅馬尼亞夜總會大火」、「比利時燒燙傷病患處理機制」、「瑞典後送醫療專機」、與我國之「八仙樂園塵爆事件」，歐盟執委會人道救援暨公民保護署(DG ECHO)極為重視我國關於「八仙樂園塵爆事件」案之處理經驗，研討會主席-- DG ECHO 公民保護政策處處長 Hans DAS 於引言指出，該總署成謝台灣願意與歐盟分享寶貴經驗，對我團專家禮遇備至，座位牌以「Taiwan」字樣並輔以我國旗標示。各國專家對我國處理八仙樂園塵爆事件，在未對外求援下，全力營救近 500 名燒燙傷病患，死亡率僅 3%之成功應變作為至表成佩。法國籍講者 Percy Military Hospital 燒燙傷部主任 Thomas LECLERC 及比利時籍講者布魯塞爾燒燙傷科主任 Serge JENNES 會後特別向我專家致意，以「極為驚人」(extremely amazing) 讚揚我國成就。DG ECHO 公民保護政策處 Hans DAS 處長會中多次肯定我團貢獻，並於會後表示，盼持續合作，歡迎我方就任何災害向歐盟提請協助。

去年八仙塵爆事件，造成 499 名燒燙傷病患、近 300 名嚴重燙傷患者，台灣醫療緊急救治後，死亡率極低，醫療成果斐然，歐盟想知道台灣怎麼做到的，研討會十分尊重台灣，不僅為我國正名「TAIWAN」，還擺上國旗。本部特別派本人率團分享及講解。歐盟執委會 (European Commission) 底下的「人道救援及公民保護總署 (Humanitarian Aid and Civil Protection)」去年起，多次邀請本部派員分享及講解八仙塵爆醫療成果，本人率領長庚醫院整形外科醫師楊瑞永、台大醫院整形外科主任戴浩志前往比利時布魯塞爾參加執委會舉辦的「處理大規模燒傷患者」研討會。

這幾年歐洲發生多次恐怖攻擊，導致不少民眾嚴重燒燙傷，歐盟各國猛然遇上這麼大量的傷患，幾乎都來不及應變，反觀台灣八仙塵爆事件的緊急醫療，成果斐然，都想知道台灣怎麼做到的。研討會在五月廿五日到廿七日舉行，有羅馬尼亞、比利時、法國等國參與，台灣是唯一受邀的非歐盟國家，歐盟在給台灣代表團的桌牌上就直接寫著「TAIWAN」，還有國旗，充分認證台灣是主權獨立國家。歐盟這項研討會的時間正好和世界衛生大會 (WHA) 重疊，我國在世衛大會遭中國打壓，沿用「中華台北」名稱，但在歐盟就沒受到干預，能大大方方使用台灣字樣，主辦單位甚至替台灣桌牌印上國旗。本人於簡報過程中不斷使用台灣圖像向各國說明搶救狀況，報告時間近一小

時，各國代表提問和討論時也都直接稱台灣，交談非常熱絡，還有人直接讚許說：「You did a great job（你們做得很棒）。」

WHO 亦專程派代表來聆聽台灣的八仙經驗。本人表示，歐洲醫師、醫療資源有限，一旦遇上大量傷患，幾乎無法處理，還得靠醫療專機送傷患到鄰國請求幫助。我國醫師遇上大災難，則是盡全力的拚命救治，才能救治這樣大量病人。

我團於會議中竭誠邀請歐盟國家蒞臨明（106）年 4 月 1 至 4 日在台北舉辦之「第 11 屆亞太燒燙傷大會」，歐方回應為有關明年將於台灣舉辦的亞太燒燙傷會議，將協助轉達訊息給歐盟各會員國知悉。後續歐盟如有召開燒燙傷相關研討會議，亦將再邀請台灣參與。

我團全程參與各項討論，亦能瞭解歐洲國家針對類似事件之經驗、緊急應變規畫及收治傷患能量，助我提升台灣先進醫療水準於歐洲之能見度，各方收穫均豐。（研討會照片如後附）。

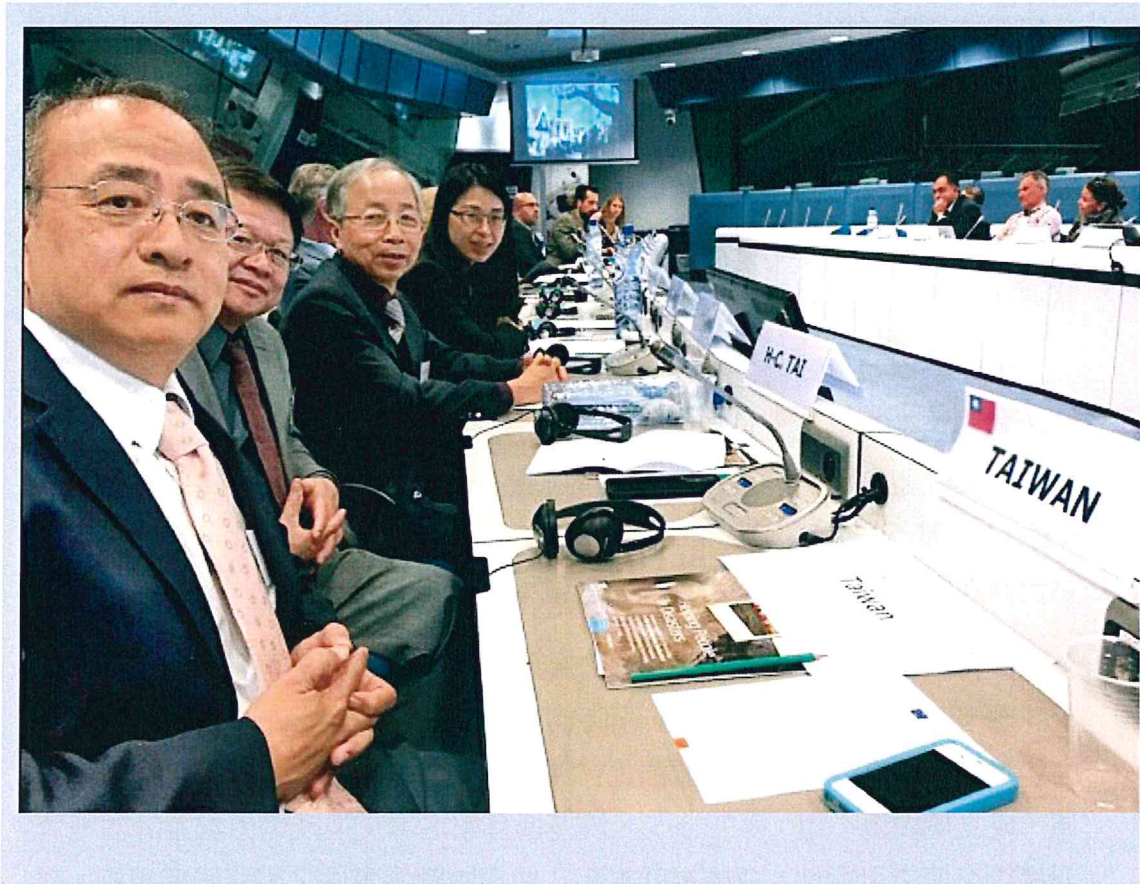
圖 1：我代表團出席研討會之紀念合影



本人率領長庚醫院整形外科醫師楊瑞永、台大醫院整形外科主任戴浩志前往比利時布魯塞爾參加執委會舉辦的「處理大規模燒傷患者」研討會之紀念合影。

資料來源：醫事司

圖 2：我代表團分享八仙塵爆醫療救災成果。



本人、長庚醫院整形外科醫師楊瑞永及台大醫院整形外科主任戴浩志於比利時布魯塞爾舉辦的「處理大規模燒傷患者」研討會，分享八仙塵爆醫療救災成果。

資料來源：醫事司

肆、 心得與建議

本次出席由歐盟執委會（European Commission）所屬之「人道救援及公民保護總署（Humanitarian Aid and Civil Protection）」舉辦，在比利時布魯塞爾舉辦的「處理大規模燒傷患者」研討會，會議上我團就去年我國發生「八仙樂園粉塵暴燃事件緊急醫療處理機制」相關處置經驗與心得，闡述我國救治大量傷患緊急應變措施、健保用於醫療費用的分配、緊急調度大體皮、敷料、白蛋白等緊急應變等作為，研討會內歐盟各國對我醫療的高水準與救護成果感到驚訝與佩服。

本研討會邀集歐盟 28 個會員圈中的專家出席，會議結論將作為歐盟內部政策評估重要參據，有利促進會員國合作，倘有需我國進一步協助部分，將樂於與歐盟會員國分享八仙案處理經驗，也盼未來延續合作；此外，更於 6 月 14 日舉行之台歐年度非經貿諮商期中檢討視訊會議中，就本案提出報告，供台灣與歐盟雙方續就研討會內容及後續合作方式交換意見。

此行我團全程參與各項討論，亦能瞭解歐洲國家針對類似事件之經驗、緊急應變規畫及收治傷患能量，同時亦有助於提升台灣先進醫療水準於歐洲之能見度。未來將思考延續並強化台灣與歐盟合作能量，就進一步研議皮膚庫、成立燒燙傷小組（B-Team）、燒燙傷專家名單交換及傷患處置評估等資訊進行交流之可行性，並檢視就本起八仙樂園塵爆事件之相關研究規劃，評估在歐盟科研架構（Horizon 2020）下，與歐方研提共同合作案之可能性。另外，我方亦能就該緊急應變計畫貢獻相關經驗，協助該歐盟執委會人道救援暨公民保護署總署用以輔助會員國建構災害應變能力，包括：（1）專家互訪、（2）共同研究案、（3）籌組會貧困專家顧問團至特定會員國考察、（4）同儕檢視及（5）跨境演習等措施。另該總署將擬訂歐盟針對大量燒燙傷患緊急應變計畫，擬自（1）災害發生後會員國相互通報及快速反應機制、（2）緊急應變中心設置及會員國應變能力共享及（3）建立燒燙傷專家資料庫三方面，研議是否可藉以擴大台灣與歐盟就在合作面向，預擬合作應變機制。

為持續精進我國緊急醫療應變體系，我國預計將成立衛福部 Central EMOC，負責協調與指揮各區 REMOC，並精進醫療管理資訊系統(EMS)，持續整合到院前、到院後救護資訊。由於醫療資源調度及醫院後送資訊分秒必爭，透過強化資訊整合與即時介入能力，即時資訊可以協助醫療機構透過傷患分

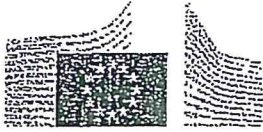
流、轉院等機制，因應短時間快速增加的大量傷患，使醫療機構收治能量及救護車能彈性運用，完善我國緊急應變機制。

另為因應未來大型災難產生大量傷燙病患之可能，並提升醫療院所燒燙傷處置緊急醫療能力，本部於今年醫院緊急醫療能力分級評定中，在加護病房章節首度納入燒燙傷照護團隊(含醫療、復健、社工等專業人員)運作之試評項目，以保存並完備醫院內燒燙傷重症處置能力。

有鑑於八仙塵暴事件後續照護所需，並強化我國燒燙傷人才培育，今年透過「培育醫事人員出國進修實施計畫」，已補助 8 名醫師、護理師、藥師、營養師等前往美國及日本進修燒燙傷口照護、復健、手術室藥局、重症營養照護等課程，以增進其專業知能，相關人才培育，更堅實團隊合作，持續精進國內燒燙傷醫療服務之水準。今年亦補助 15 名醫師、護理師、藥師、營養師及物理治療師，參與美國國際燒傷協會舉辦之國際燒傷學術研討會，分享我國八仙事件之寶貴經驗與成果，預計口頭發表 7 篇，海報發表 4 篇。

目前我國皮膚捐贈數量仍少，且目前各院處理大體皮膚之作業方式不一。為提升國內大體皮膚處理、檢驗品質，補助臺大醫院、三軍總醫院(北部)以及成大醫院(南部)共三家醫院，推動國家型皮膚保存庫建置計畫，建立符合國際水準之大體皮膚處理檢驗機制，並將整合成一個國家級皮膚保存庫，因應國內未來需求之能力。同時，以林口長庚醫院所捐贈雲端醫療資訊整合系統為核心，構建「八仙塵爆燒傷登錄系統」，作為全國燒燙病人之資料庫，並區分 6 大研究領域進行學術研究，此將更有利於未來國內燒傷病人醫療資源之整合。

未來本部亦將基於傳承經驗與分享，並回饋國際社會，持續精進政府政策作為，並與國際各界攜手合作，俾於大量傷病患時的醫療資源能發揮至大效益。



EUROPEAN COMMISSION
DIRECTORATE-GENERAL HUMANITARIAN AID AND CIVIL PROTECTION - ECHO

ECHO A - Strategy, Policy and International Co-operation
A/5 - Civil Protection Policy

Brussels, 25.2016

Mr Jack Chih-Hao CHEN
Director, Political Division
Taipei Representative Office in the EU and
Belgium

Subject: Invitation to a European Medical Corps Workshop on "Dealing with mass burn casualty disasters"

Dear Mr. Chen,

DG ECHO is pleased to invite two experts from Taiwan to the following workshop:

"Dealing with mass burn casualty disasters"

25 May 2016, 13:00 - 18:30 – 26 May, 09.00 – 12.30

European Commission, Charlemagne building, Room Sicco Mansholt

Rue de la Loi 170, 1000 Brussels

This meeting is organised within the framework of the European Medical Corps with the objective of exchanging good practices on preparing for and responding to mass burn casualty disasters.

Mass burn casualty disasters are challenging for a number of reasons. Burn care is time-, manpower- and resource-intensive. Expertise is usually concentrated in specialised burns centres with limited capacity, which may be quickly overwhelmed in mass casualty events. Treatment is expensive and a rapid response is critical. The workshop will hear evidence from a number of countries that have recently experienced mass burn casualty disasters and collect views from a wide range of stakeholders. The workshop will examine whether EU coordination and support can be further developed in this highly specialised area and discuss how we can better pool capacities across the EU and better prepare for EU-wide cooperation in mass burn casualty disasters.

The draft agenda is attached to this invitation, together with information on the expected format and issues to be discussed (Main topics for discussion). We kindly invite you to deliver a presentation on your recent experience in the Waterpark incident in June 2015, and the lessons you drew from this experience. We would be particularly interested to hear your

thoughts on the challenges associated with mass burn casualties and how we can best prepare for such incidents. Speakers are kindly invited to share presentations in advance, so that they can be circulated to all participants before the meeting.

Business travel and one or two nights of accommodation for two experts travelling from Taiwan can be covered by the European Commission as per the following procedure: Taiwan authorities are invited to communicate the names and contact details of the experts that will join the meeting and indicating their travel preferences, by 10 May 2016 by e-mail to: ECHO-MEETING-CONFIRMATIONS@ec.europa.eu. The nominated participants will be sent a link to a registration form to be completed in order to access the meeting.

The travel agency AMEX will then contact the nominated experts with a selection of available flights for the event. Arrangements made other than with the European Commission's travel agent will not be reimbursed. If your decision to attend the meeting will be made after 10 May, you will be responsible for arranging the necessary travel details.

More detailed instructions for travelling to the venue will be sent in advance of the meeting to the participants.

Please note that, when entering the building, participants need to present themselves at the reception desk and have to show their identity card or passport.

For any other details or questions, please address your requests to the email address indicated above.

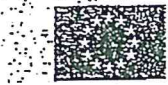
Yours sincerely,



Hans DAS
Head of Unit

Encl: Draft agenda; and
Workshop main topics for discussion.

Copy: Y. Dussart (ECHO)



EUROPEAN COMMISSION
 DIRECTORATE-GENERAL HUMANITARIAN AID AND CIVIL PROTECTION - ECHO
 ECHO A - Strategy, Policy and International Co-operation
 A/5 - Civil Protection Policy

European Medical Corps
Workshop on "Dealing with mass burn casualty disasters"
 25 May: 13:00-18:00 and 26 May: 9:00-13.00
 Charlemagne building, Room Sicco Mansholt, European Commission,
 Rue de la Loi 170, B-1000, Brussels

DRAFT AGENDA

The Charlemagne building has a strict security regime. Only registered participants will be admitted. Security checks may take up to 20 minutes.

25 May 2016

13.00 – 13.30	Arrival of Participants (security and registration – welcome coffee)
13.30 – 15.40	Setting the scene: <i>Welcome remarks by Mr Hans DAS, Head of the Civil Protection Policy Unit, DG Humanitarian Aid and Civil Protection (ECHO), European Commission</i>
	<i>Romania: Key challenges and lessons from the Colectiv club fire accident, 30 October 2015</i> <i>Belgium: The national system for dealing with burns victims and lessons from mass casualty disasters</i> <i>Sweden: The national system for dealing with burns victims in case of mass casualty disasters & Specialised Aerial Medical Evacuation assets</i> Q&A
15.40 – 16.00	Coffee Break
16.00 – 17.00	<i>Taiwan: Key challenges and lessons from dealing with the impact of the water park explosion on 29 June 2015</i> <i>Australia: The national burns plan and lessons from mass casualty disasters</i> Q&A

17.00 – 18.30	<p>Exchange of views on the main challenges</p> <p><i>Participants will be invited to exchange views on a number of questions (see "Main topics for discussion" attached), including: What are the main challenges? Is there scope to develop EU cooperation in this area? Would it be interesting to develop arrangements to better pool existing capacities? Which preparations are required to make transfers of patients possible? Can mobile teams of specialists be designed? Are there specific challenges in the area of medevac?</i></p>
18.30 – 20.00	Networking dinner

26 May 2016

09.00 - 09.30	Arrival of Participants (security and registration – welcome coffee)
09.30 – 10.10	<p><i>The Netherlands: The national system for dealing with burns victims and lessons from mass casualty disasters</i></p> <p><i>Q&A</i></p>
10.10 – 12.20	<p>Final discussion on the way forward</p> <p><i>Which follow-up actions can be envisaged within the UCPM or EMC framework or through other instruments?</i></p>
12.20 – 12.30	Conclusions

European Medical Corps
Workshop on "Dealing with mass burn casualty disasters"
25- 26 May, Brussels

Main topics for discussion

The workshop aims at reviewing main challenges and lessons learnt from mass burn casualty disasters that have occurred inside and outside the EU. It also aims at sharing information on relevant plans, policy and legislation at national level for such situations, and of available response assets. The workshop will examine whether there is scope to further develop EU coordination and support in this highly specialised area and discuss how we can better pool capacities across the EU and better prepare for EU-wide cooperation in mass burn casualty disasters.

In view of burns victims staying in the hospital for weeks and months, the impact on health systems and burns capacity is very long, and most burns services do not have the capacity to absorb more than a handful of extra patients for the long term care issues. In contrast, most large hospitals can receive and stabilize dozens of victims, but then distribute them later to the facilities that will care for them beyond the first few days. Following the initial emergency burns surgery, these patients have to go to specialist centres for the next phase of treatment. Some of these centres will exist in the affected country, but not have the capacity to cover all needs, in which case a distribution to other countries may become necessary.

Linked to this, some of the key issues likely to be brought up include the following:

- Sharing of highly specialised treatment facilities, medical staff, or specific burn dressings for severe burns patients among regions, countries and at European level. Some of the events that we will be discussing have proven that a strong cooperation is needed at European level in this sense.
 - Q: Do specialised treatment facilities for burns exist in all Participating States to the EU Civil Protection Mechanism? What is the maximum number of patients that can be treated simultaneously? In those states where it exists, are there challenges in keeping it cost-efficient? Is there a common understanding of the requirements for specialised treatment facilities for burns?
 - Q: Do specialised treatment facilities in Europe share the same language, common standards and technical requirements for treatment? Is there enough evidence and guidelines on clinical protocols for such cases? Is there a need for further research and compilation of protocols for the benefit of all?
 - Q: Is there a need for pre-agreed arrangements at European level on evacuation and treatment of severe burns patients to other countries? Which are the best instruments to address this? Are there existing arrangements at regional or bilateral levels?
 - Q: Are specialised hospitals already well connected? Is there a database of such facilities with updated contacts? If a better European network / pre-agreed arrangements are developed, how will the quality be checked / assured for the facilities in the network?
 - Q: Which are the arrangements for sharing specialist burns dressings and medical consumables?

- Q: Is there a need for defining a specialised burns treatment emergency medical team, for supporting affected states with relevant advice and/or reinforcement of their clinical staff? Is this available already?
- Aerial medical evacuation assets for severe burns patients are key for transferring such patients:
 - Q: Do such operations require specialised aerial medevac capacities? Do these capacities exist in all Participating States to the EU Civil Protection Mechanism? Is there a need for sharing such assets? Under which conditions? Do existing assets comply with the same standards?
 - Q: Are there common standards on medical evacuation of severe burns? Is there a commonly agreed procedure for the medical evacuation (i.e. in terms of the patient's clinical condition, best period for evacuation, etc)?
- Mass burns casualty incident management: dealing with burn mass casualties requires a different approach than normal incidents with respect to the immediate triage and the organisation of the clinical work. What are the lessons that can be shared? Which was your strategy for dealing with it in terms of ensuring the required staff, getting access to relevant drugs, etc?
- Crisis Communication: there are obviously significant challenges in dealing with crisis communication during such events. Are there lessons for improvement or best practices identified?
- Psychosocial support for the victims and their families and for first aiders: psychosocial support is also an important part of the management of such incidents. What is the approach that your organisation is taking in this respect? What lessons can be shared from the experiences handled so far?

Taiwan Emergency Medical Response Protocol - Formosa Fun Coast Dust Explosion Case



Director of Medical Affairs,
MOHW
Dr. Tsung-Hsi Wang



Department of Medical Affairs, Ministry of Health and Welfare of Taiwan(R.O.C.)

Overview

1. Distribution of the healthcare resources in Taiwan

2. Background to the incident

3. Statistics of casualties

4. Strategy

5. Review and improvement

6. Lessons we learned

2

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Distribution of the healthcare resources in Taiwan

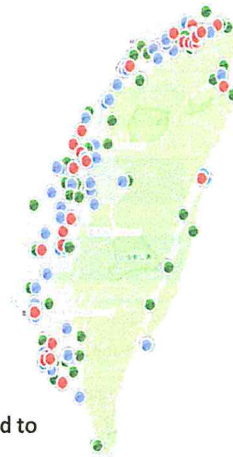


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Distribution of the healthcare resources in Taiwan

- There are a total of **194** emergency response hospitals* in Taiwan. Among them, 36 are severe level, 82 medium level, and 76 general emergency response hospitals.
- There are a total of **295** burn care beds, and 7,005 beds in total for all ICU beds for all different departments
- There are 1,484 burn cases every year, with approximately **64 cases** with Total body surface area (TBSA) > 40% burned



*Emergency Response Hospital : the hospital that is designated to take charge of emergency medical treatment.

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Background to the incident

The Formosa Fun Coast is a famous water park in northern Taiwan, it is also the largest water park in South-East Asia.



The "Color Play Asia Party" activity is acclaimed as the largest color dust party in Asia. An estimated 4000 people visited the park with around 600 people participating in the party.



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Background to the incident

•Add to the stage effects, compressed CO₂ were used to blow large amount of color dust on to the people on the stage.

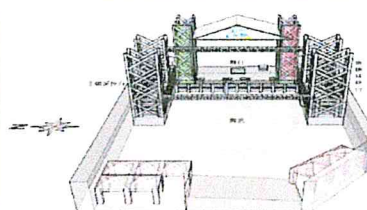
•Lighting equipment hanging above the stage reached 1,250°C, and the dust caught light as the ventilation unit for the lighting equipment drew the dust into the lighting fixture.

•The stage was setup in a drained pool, making it difficult for people to find exits.

•Added to the large amount of dust that settled on the surface of the skin, the flames caused large area burns.

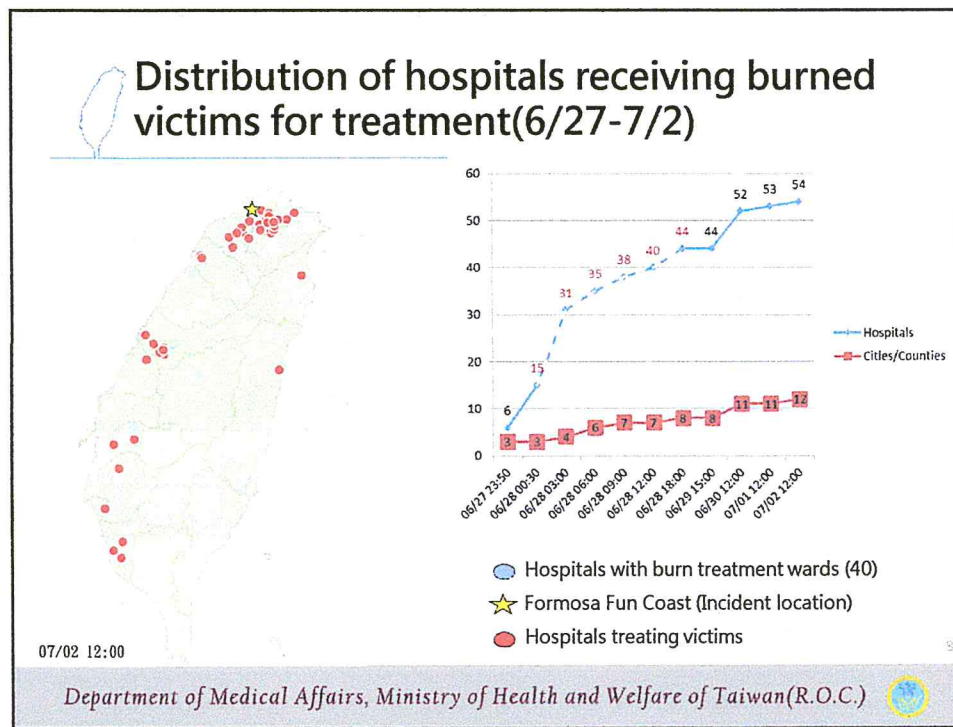
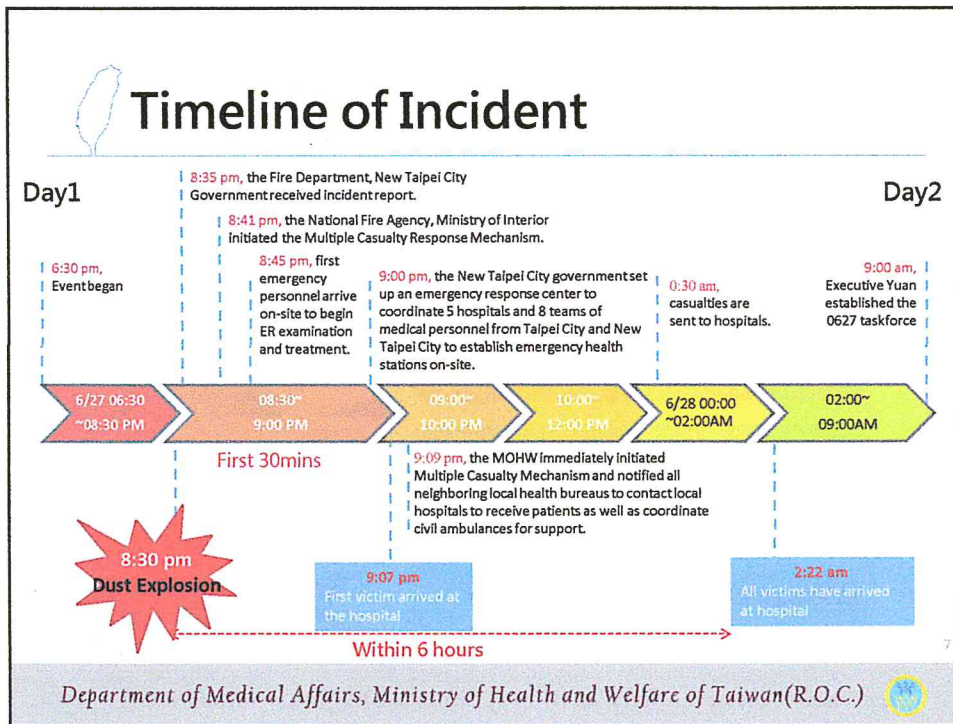
•Dust that settle on the ground were 5cm thick, and was lit again during the panic.

Live Video (1:33)



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DAY1 Media Interviews

The screenshot shows a news website with several articles. One article features a video of a man speaking. Another article shows a person's leg with a burn injury. A video player in the foreground displays the text '取皮部位 創皮最佳' (Skin removal site: Best for skin grafting) and '皮膚厚 增生快' (Thick skin, fast regeneration).

- Are there sufficient drugs and medical resources for burn treatment?
- Are there sufficient burn care beds for patients?
- Are there sufficient medical man power to handle care?
- What are the capabilities of hospitals in treating burns?

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International Media Reports

The screenshot shows a CNN news report titled "Taiwan water park" by Greg Botelho and Kevin Wang. The article describes a horrific fire at a water park in New Taipei City, Taiwan, on Saturday, June 27, 2015. It mentions that emergency rescue workers and concert spectators had to frantically search for injured victims from an explosion during a music concert. The report includes several photographs showing the aftermath of the fire, including damaged structures and emergency responders.

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Local Media Reports

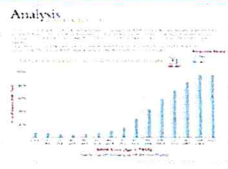
The Outcome Is "NOT Favorable"

According to the Baux score, the outcome is "not favorable", unfortunately

公式算燒燙傷死亡率「不樂觀」 醫護盡力與死神搶人
記者黃書怡/綜合報導

新北市八里水上鋼鐵廠發生灼傷意外，共有498人輕重傷，分送47家醫院救治，其中201人至少是60%以上燒燙面積，而20歲的高死亡率則高居，燒燙後重傷不治。近日多位醫師分別PO出燒燙傷死亡率公式，簡筆說明燒燙傷在醫學的限制，部分患者情況並不樂觀，只能靠醫護人員盡力與死神搶人。

北市聯合醫院醫師劉文強30日說，必須向大眾說不好的消息，大面積燒燙傷死亡率非常高，並列出公式，「年齡+燒傷面積=基本死亡分數(Baux's score)，若有肢體(吸入性灼傷)再加17；死亡分數*0.8=死亡率」。他舉例，20歲年輕人被燙、雙腳灼傷，基本死亡分數65，死亡率是65*0.8=52%，若有肢體再加17，死亡率是82*0.8=65%。【一國時報記者黃書怡報導，請詳解現在醫學的限制】。

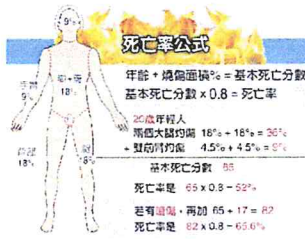


The beginning of the burn destined outcome, please understand limitations of modern medicine

Due to high mortality, "It's hard to turn the tide", sighed medical experts

大燒傷死亡率高 醫護無力回天

11316

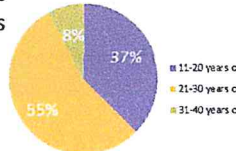
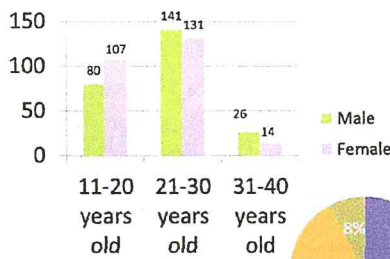


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Statistics of Casualties

- Victims are mostly young people under the age of 30
- 83% of the burned victims are burned in lower limb



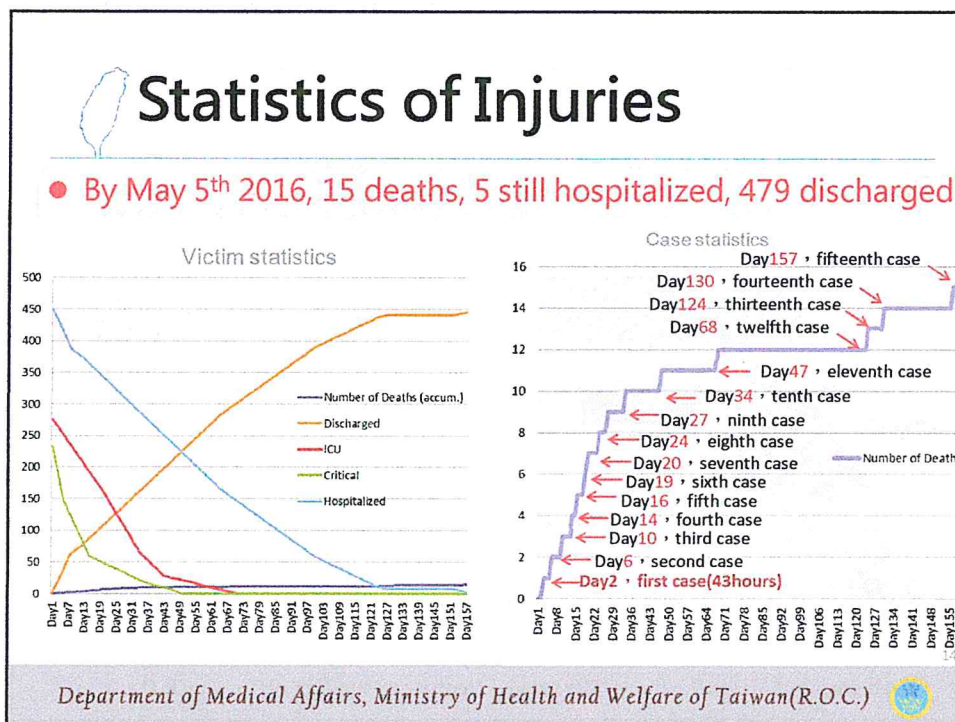
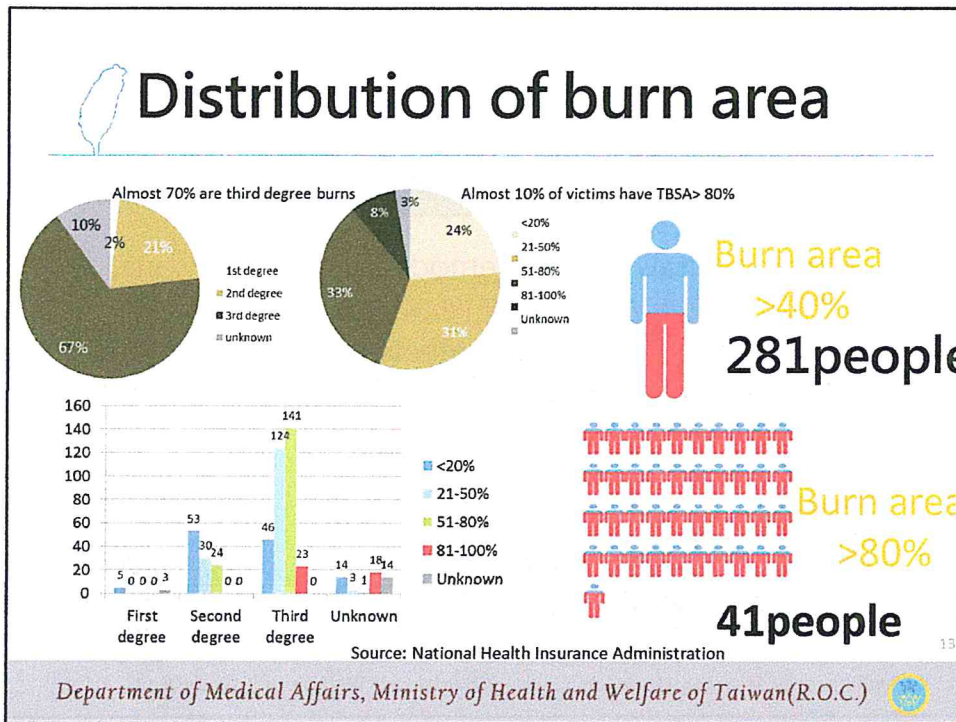
Affected body region(s)



Face/Neck	143(29%)
Upper limb	320(64%)
Body	181(36%)
Lower limb	415(83%)
Other	80人(16%)

Source: National Health Insurance Administration

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Strategies in resolving insufficient number of burn care beds

499 burned patients > 295 burn care beds

- Most hospitals actively remodeled their ICU wards into temporary burn care wards.
- If the remodeled sick bed meets requirement and is used by victims of the incident, NHI will co-pay as per burn care wards after approval.

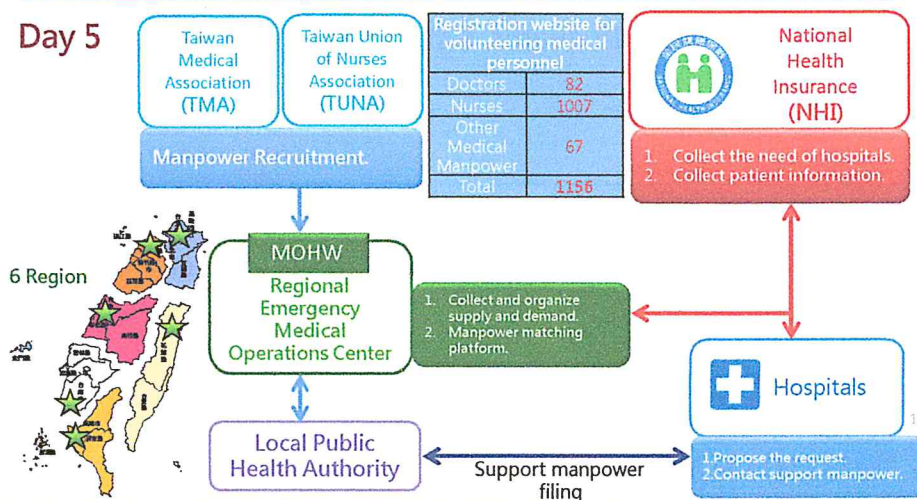


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Medical Support Platform – Manpower, Professionals, Referrals

Day 5



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Strategies in human resource coordination

MOHW (include NHI · 6 REMOC)

- Survey hospital needs through the VPN of National Health Insurance Administration

TMA & TUNA

- Integrate medical support human resource registration from current website

Local Public Health Authority

- Simplify the support reporting procedure to assist the hospitals in managing human resources

Hospitals

- 1.Coordinate the trauma nurses and resident doctors of different departments
- 2.Coordinate the doctors and nurses of other hospitals in the system
- 3.Call upon retired personnel or personnel in training



Registration website for medical personnel volunteers

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Medical support manpower invested

Time	6/27-6/28 Reception and Treatment (6/27-8/26)			
	Internal coordination within the hospital		Registration website for medical personnel volunteers (a total of 1156 volunteers)	
Method of coordination	Every treatment hospital (according to size) call upon its medical personnel to assist in the treatment of the patients.	Treatment hospitals coordinate the medical personnel from branch hospitals or those who are retired	Treatment hospital using the registration website to find matching personnel	Ministry utilizes the registration website to help hospitals find matching personnel
Number of support	Approx. 5,100-15,300 personnel	Approx. 1500 personnel	154 personnel (19 doctors, 135 nurses)	33 personnel (11 doctors, 22 nurses)
Total	Approx. 6,000-16,000 personnel			

*Self matching: the hospital will use the registration website to contact the volunteering medical personnel directly

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Reduced visit to the ER by the public



- DAY6 Director-General San-Kuei Huang urged the public to avoid visiting the ER and the temporary suspension of aesthetic medicine.

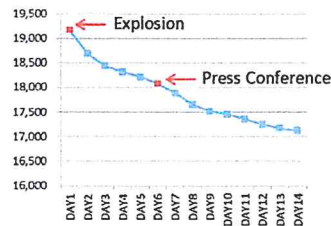
衛福部首發警示！救護負荷重 10家醫院急診別再急

八仙粉塵事件，根據衛生福利部今(2)天最新統計數字，傷患總人數確認是405人、2死，傷患人數龐大，負責收台的醫院幾乎都無力再負其他急診病患，衛福部下午罕見公開呼籲民眾，若非真正緊急重症，切勿前往台大、三總、台北榮總、新光醫院、馬偕醫院等10家醫院的急診；且呼籲暫時停做醫美，空出人力。

前三種最常見的公開呼籲民眾，若非真正的緊急重症病患，不要前往：台大醫院、三軍總醫院、聖東醫院、台北榮總、台中榮總、新光醫院、台北馬偕、淡水馬偕、慈濟醫院、林口長庚等10家醫院的急診。

衛福部醫事司長王宗棣則表示，目前緊急醫療應變中心(EOC)和各地衛生局都在嚴密觀察資訊，台灣人十分有愛心，這幾天的急診人次已超過在災區，未來針對非急重症傷患的病人，政府也會積極協助轉診，不讓這些再負有極重大任務的醫院急診室上加霜。

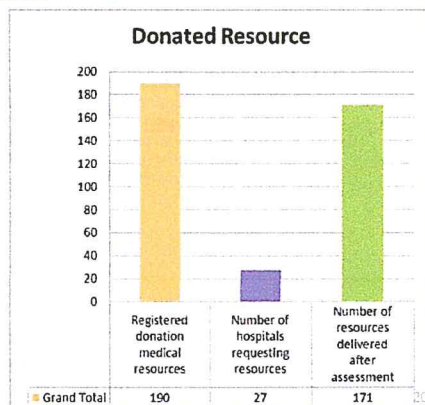
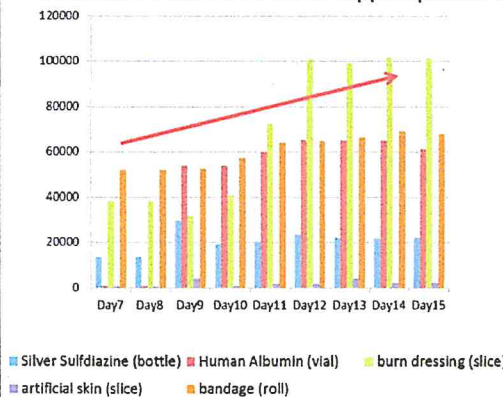
Moving average of ER patients in TW



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Coordination of drugs and medical resources for burn treatment

- The "Donated Medical Resource Coordination System for the Dust Explosion Incident" was established to have timely information on the situation of the donated medical resources so as to support patient needs



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Emergency importation of cadaveric skin by the Taiwan FDA




A total of **700,000cm²** of cadaveric skin were imported

- 1** DAY7 The first batch of cadaveric skin (37,000cm²) arrived in Taiwan from United States.
- 2** The skins were distributed according to the number of surgeries by each hospital and rationed according to the hospitals' daily needs.
- 3** DAY9 The cadaveric skin from CTS and Life Net (118,000cm²) arrived in Taiwan.
- 4** DAY11 Cadaveric skin from Euro Skin Bank (90,000cm²) arrived in Taiwan.

A total of 571,600cm² of cadaveric skin were used. Remaining unused skins are distributed to the 11 burn centers with skin banks.


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Exchange with the Japan Delegation-1


Trip

- The exchange was organized by Taiwan Roots Medical Peace Corps and Taiwan Medical Association.



Delegates


- 6 delegates consisting of physicians and professors in the field of critical and burn care.




Itinerary

(2015.7.12-15)

- Upon arrival, the Japan delegation visited the 5 major hospitals for treating burn patients. In total, they visited 122 patients with third degree burns



Department of Medical Affairs, Ministry of Health and Welfare of Taiwan(R.O.C.) 

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Exchange with the Japan Delegation-2

Experience Sharing

- Priority in the critical period for patients with large burn area is to stabilize patient life.
- Distribution and use of artificial skin and cadaveric skin should be based on patient clinical needs.



Most Impressed with Taiwan's Emergency Response Capabilities

- Taiwan handled the incident very well, and demonstrated high standards of medical quality.
- The treatment of burn patients is expensive and long, without government support and investment, it would be difficult to achieve the goals.



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Exchange with the US Delegation-1

Trip

- Arrived in Taiwan on President's chartered plane.



Delegates

- 6 delegates from Johns Hopkins Burn Center from US



Itinerary (2015.7.18-24)

- Upon arrival, the Johns Hopkins delegation visited the American patient
- During the 7-day trip, the delegation visited 12 hospitals



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Exchange with the US Delegation-2

Experience Sharing

- The US delegation shared their treatment experience with our medical personnel, and provided professional feedback on the source of skin transplants and high-pressure oxygen treatments.

Admiration for the effort and dedication demonstrate by our medical personnel

- The delegates commented on the coordinated response and treatment of burn patients as "Amazing", and wish to continue with further exchange on this topic in the future.

Minister Tzou-Yien Lin

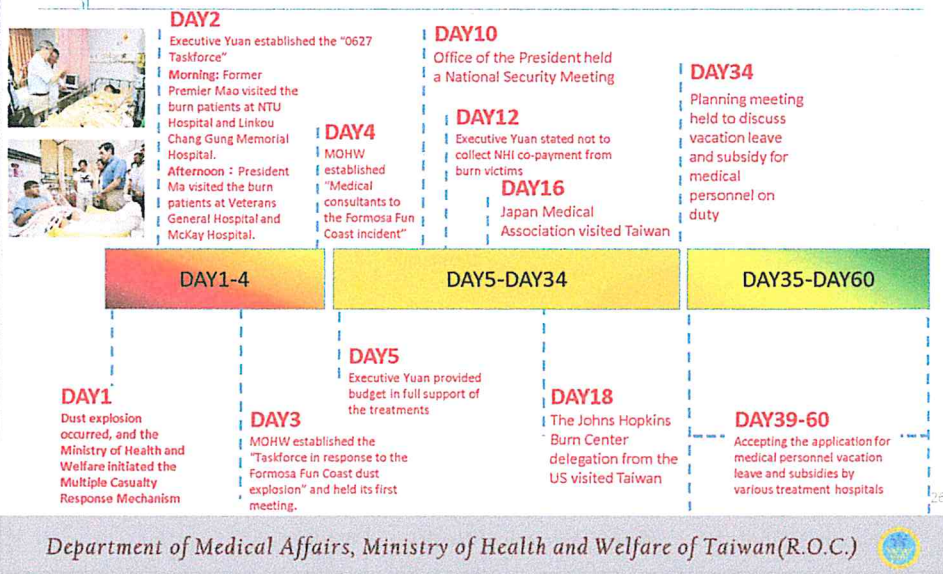


Presidential Banquet to express our gratitude

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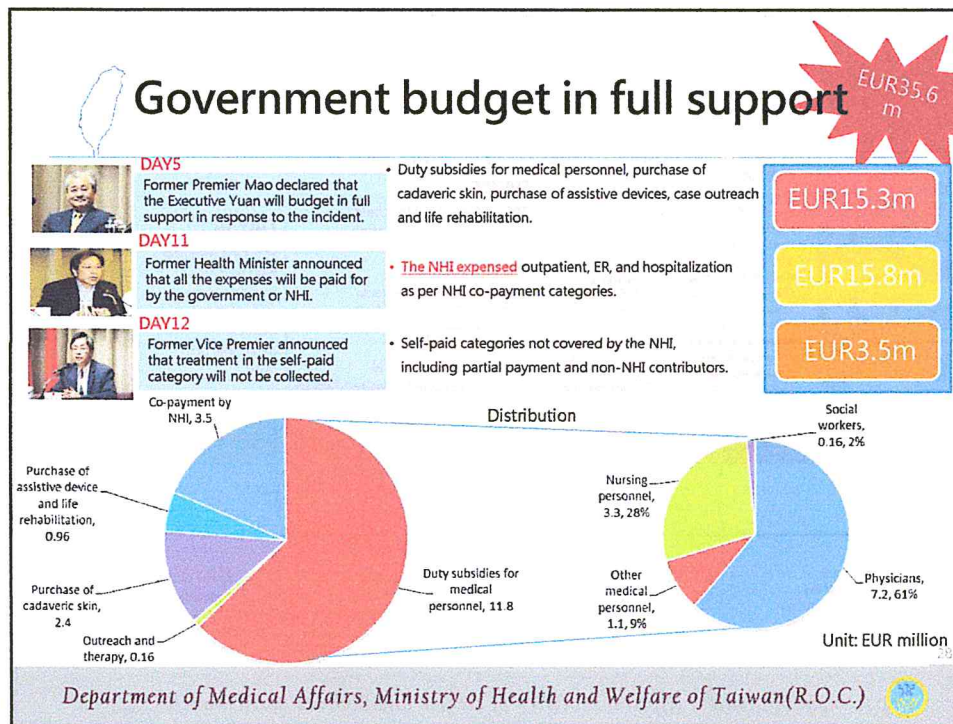
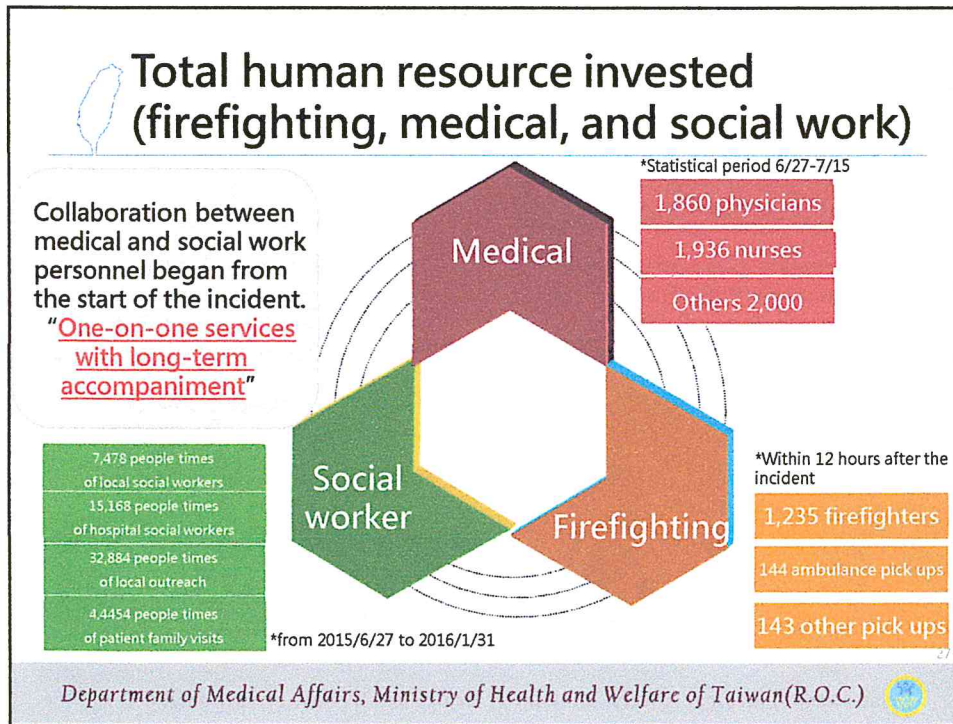


DAY1-DAY60 TIMELINE



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A True Medical Miracle

Percent Mortality(modified Baux score)
= Age + Percent Burn +[17 x (Inhalation Injury, 1= yes, 0= no)]

Calculated Result

- Average Percent Burn : 41%
- Average of Age: 23yr
- Average Mortality Rate

> 64%

Burn statistics from 2000 to 2012 by the TMU Hospital

Burn TBSA	Mortality Rate
40-49%	17%
50-59%	22%
60-69%	32%
70-79%	50%
80-89%	62%

Real result in Taiwan

- Discharged : 479
- Death toll : 15
- mortality

3%

Reference: Osler T, Glance LG, Hosmer DW. Simplified estimates of the probability of death after burn injuries: extending and updating the BAUX score. J Trauma. 2010 Mar;68(3):690-7.

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Love continues

- Mr. Chia-Sheng Su, a junior year dental student of Taiwan Medical University, unfortunately passed away during the incident. His parents decided to donate his organs (heart, liver, pancreas, kidneys, cornea, small intestines, veins), helping more than 10 patients.
- Taipei Medical University believes that the love from Mr. Chia-Sheng Su should not be forgotten and continue as a legacy. Therefore, the University established a "Chia-Sheng Su organ donation fund" from the donations from institutions like Nanshan Life Insurance. Over NTD. 10 million (about EUR 300 thousand) of donations were devoted to charities and organ donation activities.

紀念塵爆亡者設基金 蘇家陸父母飲淚致謝

新聞稿: 蘇家陸父母飲淚致謝
日期: 2015/04/20 | 12:47:51 | 事件: 2015/04/20 15:04:49



八位獲捐者與家屬(左)與蘇家陸父母(右)在記者會上致謝。蘇家陸父母在記者會上致謝。記者: 楊富勳攝

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Mother of death previously accusing patient referral delays, changes and thank Hospital.

My family is my biggest support. I won't just leave like that, not even amputation would change my mind.

His family couldn't bear to see him suffer and discussed with the medical personnel to give up emergency treatment

雙腳、右手截肢·八仙塵暴傷最重的倖存者：一滴水的味道·倖人間極品



八仙塵暴第9死！呂冠球不治 哥羅羅愛人間



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International Media

- **Man badly burned in Taiwan water park explosion happy to be 'pretty independent' 5 months on.**
-DAILY JOURNAL December 04, 2015



- One of the victims in the Formosa Fun Coast incident is from New Hampshire, US.
- Alex Haas received 90% area burn injury during the incident and after 5 months of rehabilitation and treatment, he is now stable.
- Alex shot a short film thanking the medical personnel in Taiwan for their care and concern.

Thank you video (28s)

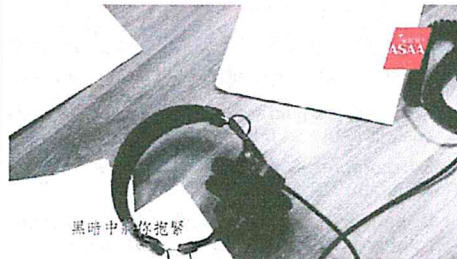


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I Pray for you

I Pray for you

Let me stay with you



•Taiwan artists created songs to encourage the victims and families of the Formosa Fun Coast incident. Through music, the artists hope to deliver the message of courage, love and hope to the victims.

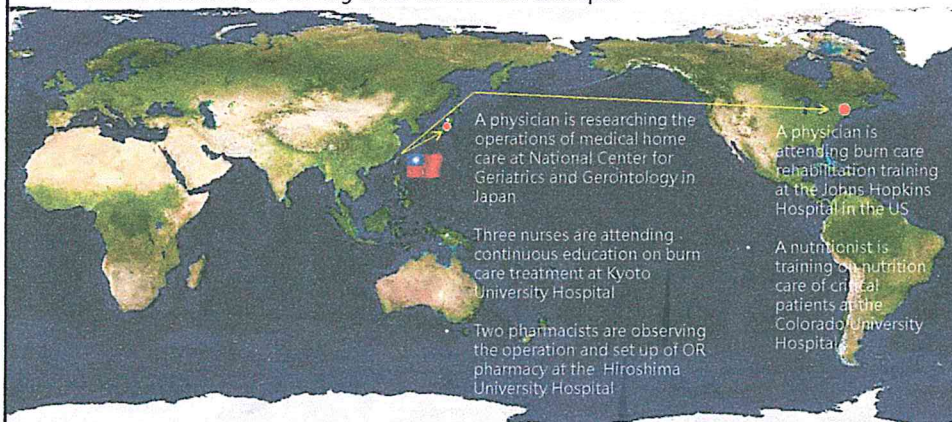
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Continuous education and training

A total of 8 medical personnel (physicians, nurses, pharmacists, and nutritionists) were subsidized for continuous education and training in the United States and Japan



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Publications at the ISBI

In 2016, fifteen medical personnel (physicians, nurses, pharmacist, nutritionists, and physical therapists) were subsidized to attend the ISBI in US to [share our valuable experience and achievements in the Formosa Fun Coast incident](#).

7 oral presentation were published

- How to restart a burn unit when facing a massive dust combustion accident
- Adapted burn fluid resuscitation protocol based on autocalibrated arterial pressure waveform analysis improves fluid creep in major burns
- Extracorporeal Membrane Oxygenation Circulatory Support in Patients with Burn and Severe Acute Respiratory Distress Syndrome
- Using varied skin graft techniques in major burn wound reconstruction: Experience learned from color powder explosion accident in Taiwan
- "Tangential excision debridement combined dressing with Actocoate " as Surgical strategy for Mass Casualty Incidents - Experience in CGMH Taiwan
- Early Physical Therapy for a Patient with Major Burn, Inhalation Injury and Out-of-Hospital Cardiac Arrest
- The effect of colored cornstarch dust exposure on the outcome of fluid resuscitation

4 posters were published

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Burn Care Treatment and Rehabilitation Symposium and Training

On 2015/8/14, the annual meeting and Formosa Fun Coast symposium for Taiwan Society for Burn Injuries and Wound Healing was held.

On 2016/1/23, the Johns Hopkins burn treatment team were invited to attend and exchange at the "Conference on Burn Care and Rehabilitation" where 290 medical professionals attended.

On 2015/12/19, the "Christmas party for burn patient support groups" was held to celebrate festivities and to encourage the burn patients.



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Strengthen rehabilitation and intervention by community service

Three sessions of "Physical and Occupational therapy training" were held, with a total of 600 people participating. Ten sessions of "Workshop on training and technical practice" were held, with a total 294 people participating.

Created clinical guides and assessment tools for patient function, as well as 6 health education manuals on clinical care

Conducted home physical therapy for 50 patients and occupational therapy sessions for 24 patients. One patient support group activity was held, with 40 people participating.



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Set up skin banks and burn patient database

National skin bank establishment program

- In order to improve the handling of cadaveric skin and the related quality of testing, the government is subsidizing three hospitals.
- Establish cadaveric skin treatment and testing mechanism meeting international standards as well as **integrating a national level skin bank** to prepare for future needs.

National level burn patient database

- Established the "**Formosa Fun Coast Burn Patient Registration System**" based on medical cloud technologies.
- Six major research areas are categorized for the purposes of experience sharing and contribution to the international community for their support.

NTU Hospital
Tri-service Hospital

NCKU Hospital



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What else

Former Premier Mao announced the ban on the use of any dust or color dust in public activities on DAY 2.

Approve "Safety management measures for large activities", "Main points in the safety management of large crowd activities", and amendment of "Regulation for the Management of Tourist Amusement Enterprise".

Conduct annual audits on tourist amusement enterprises, with stringent emergency care planning and MCI emergency drills.

Research and amend regulations to strengthen the mandatory insurance coverage of public accidents.

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Lesson we learned

It's passion that helps us get through one disaster, but only a well-functioning responding system can prepare us for all the disasters in the long term.



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 Thank you



Taiwan 's MOHW organized "2015 Emergency Medical Contribution Award and ceremony of Formosa Fun Coast explosion awarded event" to thanks meritorious.

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