## F58 Forensic Odontology in the Aftermath of the 2009 Australian Bush Fires

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After attending this presentation, attendees will have a greater understanding of the issues involved in the identification of victims of a large bushfire, with particular reference to forensic odontology techniques.

This presentation will impact the forensic science community by serving as a reference for improving forensic odontology practice and preparedness in dealing with mass casualty events.

On February 7 and 8, 2009, the state of Victoria suffered the hottest temperatures ever recorded, with some parts of the state reaching 48°C and an average temperature of 46.4°C (115.52°F). Combined with hot northerly winds reaching speeds of 130kpH, this resulted in the creation of a firestorm which ravaged approximately 1 million acres and destroying over 2,200 homes. The fire danger index on February 7 was recorded at 180; an extreme reading on the same index is 50. There were 173 fatalities resulting from this disaster, 164 of whom were included in the DVI operation mounted. Over the ensuing days and weeks 298 suspected human remains were admitted to the Victorian Institute of Forensic Medicine (VIFM) for identification.

The Odontology team's contribution to the Victorian Bushfire tragedy involved the commitment of the totality of the forensic dental resources within Australia, as well as assistance from both Indonesia and New Zealand. In total, over 50 forensic dentists deployed to VIFM over the operational period, and at the peak of the identification process we had up to 20 dentists on site at any one time. The majority of the forensic odontologists utilized in this operation had many years of previous mass disaster experience. Many had been involved in both the 2003 Bali bombings and the Boxing Day 2004 Tsunami, and so were well equipped to deal with an operation of this magnitude.

The geographical scope of these massive fires, coupled with the condition of many of the deceased, made both scene examination and identification work very challenging. The odontology team worked in all phases of this DVI process, from multiple scene attendances to assist police with the complicated recovery of commingled and severely damaged remains (Phase 1), to the mortuary where we conducted our detailed examinations of the deceased (Phase 2). Dentists were also heavily involved in antemortem data collection and interpretation (Phase 3). Once all antemortem and postmortem data had been entered onto the computer program DVI Sys®, by Plass Data, the exacting task of matching these records and providing identifications could begin. Reconciliation is the culmination of our work, where we match antemortem and postmortem findings in order to confirm the identity of deceased individuals (Phase 4). Following the confirmation of identity, our findings were then presented to the State Coroner in formal identification boards.

The Victorian bushfire was the first disaster victim identification operation where the odontologists worked almost exclusively with digital information. To ensure accurate and error free handling of this information, and subsequent high quality analysis, a series of new standard operating protocols were developed. These protocols will prove to be an invaluable tool for the management of any future incidents.

At the conclusion of the last identification board on the April 30th, there had been some 140 dental reports generated, 65 of these being a positive dental match, and 48 being probable matches. Dental evidence was presented in all of the 19 identification boards, and odontologists contributed to the evidence confirming identity in approximately 60% of cases. The remainder of our reports dealt with non-human remains, exclusionary reports, and reports on commingling of human remains. Of the 164 individuals included in this DVI operation, 163 were positively identified, with only one person for whom no remains were ever discovered.

In all phases of this process odontologists worked closely with mortuary staff, police, coronial staff, administration staff, IT staff, and other scientific staff at VIFM including molecular biology, pathology, and anthropology. This close cooperation enabled our work to proceed with the greatest efficiency and resulted in timely and accurate identifications. The remarkable conclusion to this operation was that out of 164 people reported missing as a result of the Black Saturday fires, positive identification of 163 individuals was achieved, with only one person for whom no remains were ever discovered.

**Odontology, Disaster, Identification**

 ** Presenting Author*