

The London Atlas of Dental Development and Eruption is an original and accurate diagnostic tool for dental age estimation in individuals up to 22 years. It has provided invaluable resource for a number of groups, notably disaster recovery workers (to identify the ages of tsunami, war and earthquake victims) and to archaeologists (who seek to learn more about archaeological remains). It has also been called on as courtroom evidence in the cases of asylum-seeking minors. The Atlas has global reach as it is freely available as a web download in more than 22 languages.

The 2004 Tsunami highlighted the need for an evidence-based atlas as well as testing which of the many methods of age estimation was most accurate. The London Atlas began as a PhD project of Dr. Sakher AlQahtani and consists of a series of drawings of dental development for 31 age categories from before birth to 23 years of age. It is based on tooth data from foetal and skeletal remains of individuals with known age-at-death as well as dental radiographs, from Maurice Stack's Collection at the Royal College of Surgeons of England and Spitalfields Collection at the Natural History Museum in London. The London Atlas was published in a peer-reviewed journal in 2010. Dr AlQahtani has world copyright for the image and it is freely available and as free software in English.

The Atlas was designed specifically to estimate age, to overcome the major flaws of the previous dental schemas. Improvements include detailed tooth stage descriptions, clear illustration with internal and external features of each tooth, adequate and representative sample size, age variation for each tooth stage and consecutive age categories. Dr AlQahtani validated the London Atlas on skeletal remains and dental radiographs of known age individuals and showed it to be the most accurate method to estimate age from developing teeth. When piloted, the Atlas was also found to be easier and clearer than previously used dental schemas. The importance of the London Atlas as being suitable to estimate age worldwide. The work was funded by The Ministry of Education, Saudi Arabia.

The inspiration for the research described above was the 2004 Tsunami, which highlighted the need for an evidence-based tool, presented in an accessible format, to accurately estimate the ages of victims to help human identification. It has been widely covered in the scientific and lay press and listed as a key source in textbooks. The London Atlas was subsequently used to estimate the ages of victims in the air crash in Libya in May 2010 and the earthquake in New Zealand in February 2011. Professor Jules Kieser, Director, Sir John Walsh Research Institute, University of Otago, Dunedin, New Zealand commented: "...as a forensic dentist I, together with my team, used your atlas when we did the identification of the victims of the tragic Christchurch Earthquake. The atlas enabled even inexperienced volunteers to understand dental ageing, and possibly most importantly, it was hugely useful when presentations were made to the Coroner's Board. They were able to get a visual appreciation of what we were telling them. In summary, thank you again for providing us with a landmark in the field of dental ageing."

The London Atlas has now been adopted by the New Zealand Society of Forensic Dentistry. The London Atlas is now an accepted method of age estimation around the world, and is used in training workshops run by the American Academy of Forensic Sciences, the International Organisation of Forensic Odontology, and the Biological Anthropology Research Centre and Bio-archaeology, Warsaw. Professor Bob Wood, Forensic Dentist and Disaster Victim

Identification (DVI) trainer, Toronto University, says the Atlas is part of the standard information pack given to the Canadian DVI team. In November 2010 Dr Liversidge was invited to present at the 'International Workshop on methods for age estimation in teenagers and young adults' held by the Norwegian Directorate of Immigration and the Baltic Medico-Legal conference. This resulted in a policy change of practice dealing with estimating age of age disputed asylum seekers in Norway. The London Atlas is used in teaching of forensic anthropology (UK, Canada, USA, Israel, Italy), disaster victim identification (UK, Australia, Canada, Pakistan), forensic dentistry (UK, Belgium, Canada, American Board Forensic Odontology, USA) and archaeology (Bradford, Liverpool John Moore, University College London UK, New Mexico, USA). The Atlas has been used to estimate age of forensic cases in UK, Switzerland, Israel, Australia, New Zealand, Libya, Canada, New Mexico, Texas and Washington State USA.

The teaching of dental anatomy and development of the dentitions also relies heavily on the London Atlas: it is currently used in most dental schools in the UK, as well as those in Belgium, Croatia, China, Finland, Germany, Greece, Israel, Iceland, Norway, Switzerland, USA, Canada, Japan, Malaysia, Middle East, Australia, New Zealand and Venezuela. The London Atlas has also been used by archaeologists for ageing skeletal remains in USA, Greece and Peru. Finnish forensic archaeologist Dr Jana Hurnane and her team consulted the atlas to learn more about child mummies found in Peru. A well-executed dissemination strategy has been key to the widespread use and success of the London Atlas.

World wide copyright was taken out in 2009 to allow free access on the internet. The app has been downloaded many thousands of times. A training video has been developed and is freely available on the internet. The project was shortlisted for Research Project of the year by Times Higher Education Supplement in 2012. The London Atlas was shown in 'History Cold Case' documentary on BBC2 in May 2010.