This lecture is about the handling of large numbers of dead.

It is possible some persons will find both the detailed lecture content and some of the visual images disturbing.

It may be reassuring to know that those who deal with mass death are professionals most of whom are sensitive about how they deal with bodies.

It has been the policy of my research unit, the Emergency Communications Research Unit (ECRU) for 40 years not to identify human sources or documentary sources that are not on the public record.

It is also the policy of ECRU to try to identify lessons learned but to avoid pointing fingers and identifying scapegoats were errors occurred.

"Those who cannot learn from history are doomed to repeat it."
—George Santayana

Today’s topic is identification of mass dead
Will look in considerable detail at one specific incident – the Indian Ocean tsunami
Will review how identification of dead used to be done and how it is done now
First however I want you to work out a brief scenario, then I want to introduce you to what we define as incidents, disasters and catastrophes – and tell you why this is important

Scenario for You
Try to remember when you were seven or eight years old – at home with parents or whoever you lived with
Assume your home was hit by an earthquake or if you prefer a tornado
What would be your parents’ first concern?
**Question for you?**

- How is one person who has died identified?
- Do the circumstances of death make a difference to how a body would be identified?
- Do things change when there are many dead?
- Think about it for a minute and note your answers
- I want you to keep in mind your answers to the scenario and your answers to these questions as we move along – they will help you follow and understand what I have to say

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**Visual ID Does Not Work**

- Important to start with one fact – and that is that visual identification of a body is highly unreliable
- After a plane crash in Denmark, the survivors were asked to identify the dead and all agreed and all were wrong in every case.
- Sometimes people want to have a body so will select any body – when some bodies are not recovered as often happens e. g. Air India crashed into the Atlantic or the oil rig, Ocean Ranger capsized
- Yet in western world ID is important – for emotional reasons (closure) but also for legal reasons including insurance, inheritance, even right of survivor to marry

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**Going to Tell A Story**

- You probably think of research as developing an hypothesis, setting up an experiment to test it, working out the results and sharing them so others can replicate the experiment – and – one hopes – get the same result
- However, theories can also be derived from research. This approach – described by Glaser and Strauss – is known as grounded theory. It involves collecting data trying to make sense of it until one can share results and propose a theory
- Emergency research – especially mass death research – would be hard to do in a lab. One can not go out and kill thousands of people to test an hypothesis, one must take advantage of opportunities when they arise.

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**The Trail**

- I have been doing research in Sociology of Disaster for 40 years
- Began by tracing rumours and leaks for the Operations Research Establishment of the Defence Research Board
- Moved to quick response studies of untoward events – snow emergencies, fires, floods, tornadoes, toxic incidents, evacuations, air crashes, etc. – working with a team of student volunteers
- Studied role of mayor, mass casualty management, contaminated casualties, media, federalism and disaster, economics of disaster
- Moved on to handling of dead after the 1917 Halifax explosion
- Then on to the same subject after the Indian Ocean tsunami
- Then to Canadian mass death incidents
- Each flowed from the previous one – previous research allowed me to understand and explain what I was finding

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**Definitions: Accidents, Disasters, Catastrophes**

- We often use the word “disaster” colloquially; but to those of us who study human and organizational behaviour in emergencies the term has a fairly specific meaning
- I say “fairly specific” because there is some debate about its use.
- However, I - like those I studied with – see emergencies as being divided into three categories – incidents, disasters and catastrophes

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**Incidents**

- Incidents are events like motor vehicle accidents; train wrecks, air crashes at airports, building collapses
- They are usually what I call “site specific” which means that occur at a clearly defined location – one that can be controlled
- The emergency part is usually are over quickly and are usually handled by emergency agencies – police, fire, ambulance, hospitals etc.
Air France Crash

- Crash occurred August, 2005
- Plane on landing ran off end of runway at Pearson airport
- Everyone got out
- Some just walked away and headed home or to an hotel – Customs had to track them down
- 297 passengers, 12 crew, only 12 suffered serious injuries
- Accident not disaster

Disaster

- July 31st, 1987 tornado hit Edmonton, Alberta
- Started south of city, went north through city, into neighbouring Strathcona county, back into Edmonton
- Finally hit Evergreen Mobile Home Park
- Impact lasted one hour five minutes
- Left trail of damage and destruction, injury and death
- No specific site, no site control possible, initial response often by civilians e.g. at trailer park

Edmonton Tornado


Flooding Blocked Streets


Damage and Destruction
The Edmonton tornado was a disaster. It did not overwhelm the city’s response capacity.

But initial response was by uninjured and injured survivors, they did initial search and rescue, initial transport to hospital.

Most important the tornado did not occur at a single location and it did do something else – it caused harm to the infrastructure and the residents of a community – That is the definition of a disaster developed by one of the pioneers in the field, Charles Fritz.

Air France did not threaten or harm Toronto, the tornado did threaten and harm Edmonton – that is a key difference.

One of my colleagues, Dr. E. L. Quarantelli, has argued there is a third category – a catastrophe.

This is an event which overwhelms the resources of a community – local people can’t cope on their own.

Katrina was a catastrophe – and not just for New Orleans.

So was the 9:04:35 am, December 6, 1917 Halifax explosion.

French ship Mont Blanc collided with Norwegian ship, IMO, caught fire and then exploded.

Cargo aviation gasoline, wet and dry picric acid, gun cotton and TNT- sequenced explosions.

One seventh power of first atomic bomb.

Explosion caused more than a thousand fires, damaged every hospital in the city, left one fifth of the population injured or dead – 9,000 injured, about 2,000 dead.

Initial response inevitably by survivors, mainly women – occurred during working day when men were at work or – it was 1917 – away at war.
These definitions are important because most emergency plans are prepared as if all emergencies were incidents. Thus mass death plans assume:

- All bodies will be in one place.
- That location can and will be controlled by the authorities.
- No body will be moved until the area is staked out and each body is marked and photographed in place.
- Removal will be done systematically.
- It sounds good and sometimes works.
The December 12, 1985, Gander crash was an incident at a specific controllable location and it did not threaten Gander—the RCMP emergency plan worked. The problem is that after a widespread destructive incident the bodies are not all in one place. Since there is no site there can’t be site control. Instead of bodies being left until they are marked and photographed they are—usually by civilians—taken to places such as public buildings—hospitals, schools, religious institutions. No records are kept of where the bodies came from. On such occasions the plan the RCMP used in Gander—which is typical of such plans—does not work.

The bodies from Gander were all flown to the US military morgue where they were processed in assembly line fashion—dental x-rays, full body x-rays, photos, fingerprints, full autopsy. Normally identity is confirmed by matching post-death data to medical records. However the medical records of the soldiers of the 101st Airborne killed in Gander were on the aircraft that crashed—as were the duplicate medical records.

Disaster research has now been around for about 60 years on a sustained basis—though pioneer studies go back to one by Samuel Henry Prince (a Canadian) who did his doctoral dissertation for Columbia in 1920 on the Halifax explosion. There was also considerable scholarly discussion by persons like Rousseau and Voltaire on the meaning of the Lisbon earthquake of 1755—mainly around whether it was God’s punishment of evil city dwellers. Most research is more recent—post World War II—and it has led to some now well established findings—findings which you illustrated when we did our scenario a few minutes ago. 1. People perform quite well in such events—they do not go into shock, they are not dazed and confused, they do not panic—in fact individuals do most of the initial response. 2. Organizations in contrast generally do not perform well—they have trouble establishing what needs to be done and often respond as if people were not capable of doing things on their own.

One example of this: Crime rates usually drop in the wake of destructive incidents—disasters do not turn ordinary people into criminals. However organizations believe the opposite so police may deploy needed resources to “prevent looting.” I am not saying there is never looting in the wake of incidents—I am saying it is not normally the case—of course people as you discovered may do things they would not normally do—things that normally would be considered criminal acts. A slightly different definition: a disaster may be an event which threatens but does not actually cause harm—if it disrupts a community. July 31st 1985 train derailment and toxic spill—chlorine, styrene, propane, toluene and caustic soda—led to 217,000 people being evacuated from Mississauga, Ontario—definitely a disaster. No dead, only one serious injury, that one to a firefighter... yet it was a disaster—it did threaten and did disrupt a community. Many dead—air crash at airport—may be only an incident, not a disaster, since it does not threaten to or actually disrupt a community.
Most of these examples are events my students and I actually studied — not Air France — but did study five other air crashes including Gander did go to Edmonton, did go to Mississauga, did study Halifax explosion — and did dis study of Canadian Forces response to Katrina.

I was aware of problems of dealing with dead — but that was not my area of interest.

However happened to attend a lecture at U Colorado (Boulder) by coroner from Kobe, Japan, discussing how dead were dealt with after Kobe earthquake.

He said many unusual things happened — they did not seem that unusual to me — so I did a little research — and wrote two articles using data I and my students had already gathered.

I thought I was done with mass death but after Indian Ocean tsunami I had calls from two US colleagues.

Research money was available — Did I have any ideas?

I had two — they liked one much better — we should study the handling of the dead.

Deal was made — they would go to Asia, I would look at overseas response — I would visit Israel, France, the Netherlands, Denmark, Norway, Sweden, the UK, Canada, New Zealand and Australia — talk to police, diplomats, forensic scientists etc. — always on the understanding I would never identify my sources.

All this with funds from the US National Science Foundation.

A peaceful morning then catastrophe.
On December 26, 2004, an earthquake in the Indian Ocean created a tsunami that took the lives of an estimated 300,000 persons. As you have just seen, some of those – many of them European tourists – died when the tsunami struck Phuket and other tourist locations in Thailand. Others died in Sri Lanka where the tsunami hit communities and infrastructure along the coast.
Sri Lanka ordered all foreign bodies to be shipped to the hospital morgue in Colombo. That did not happen – and the photos you just saw tell you why – road and rail damage along the coast made this impractical to impossible. Different in Thailand, most bodies in a few locations – no damage elsewhere. Different again in Indonesia where entire villages were wiped out, something like 200,000 dead, identification was impossible. Survivors began to pick the bodies of the dead, took them to hospitals (Thailand, Sri Lanka), to Buddhist temples (Thailand) and mosques (Sri Lanka) – no records where they came from, who they were. Many were in bathing costumes – no ID on bodies. Soon the stench of bodies decaying in the hot humid weather could be smelled kilometres away. This is usual after a widespread destructive incident – initial response is by survivors, not emergency personnel – exactly what happened in Halifax in 1917 – there dead were taken to a school basement.
At the same time, persons all over the world – alerted first by mobile phone then by BBC World and CNN – began to call foreign ministries to inquire about their loved ones. Most foreign ministry call centres were overwhelmed. In Sweden the foreign ministry first gave the job to a private company then the police. In London the Foreign and Commonwealth Office turned the job over to the police. Israel had more experience and calls came on Sunday – a working day – not Christian. Canada had better system — COSMOS. Question – what info is crucial? Netherlands purchased and improved on the Canadian system. New Zealand had a back-up with the Red Cross (trained in Canada). Australia had recorded advice while persons waited. All nevertheless were swamped. Soon, as well, teams of police and forensic scientists (and some diplomats) went to Thailand and Sri Lanka – and began to try and find and identify their own dead. It is far from clear how successful they were – it is clear they made some mistakes. Sir David Vaness and the West London coroner – she later went to Thailand. Problems in Sweden when first body arrived. A few – Canadian, South African were done using simple forensics – finger prints on driver’s license.
They numbered the bodies and showed numbers in photos; but many numbers fell off or became unreadable. Effects with same number could no longer be connected to a body. In Thailand, many bodies were covered with dry ice. In Sri Lanka hundreds were painted some with formaldehyde. Neither approach did much good.

In both Thailand and Sri Lanka, officials took photos of victims, posted them on notice boards and web sites.

Six bodies were released to Danish persons who said they were next of kin. Some were cremated.

In Sri Lanka public address systems on mosques – usually used to call people to prayer – were used to ask people to come and identify the dead.

Everyone was warned that there would soon be mass burial of unidentified bodies -- that did happen – foreign bodies were buried separately.

Most early ID’s were done visually – we will never know if they were accurate.

Since most bodies were buried there were several challenges:

First place where bodies were buried had to be found.

Second had to gather sufficient data for police to seek exhumation order.

Third had to convince a judge to order exhumation.

Fourth had to exhume.

Fact: every grave that was exhumed had at least one foreign body.

But British also agreed to try and identify any Sri Lankans found in those graves.

No bodies were buried.

Eventually cold storage trucks were located.

Eventually thanks to Normeca a Norwegian firm morgue facilities were constructed.

Buildings were flown in from Slovenia.

Equipment was purchased or adapted locally.

Cold water was made available and was air conditioning.

Moving bodies to morgue raised cultural issue.
Identifying mass dead takes four steps:

1. You need to know who is missing – fairly easy after air crash with passenger list, not so easy after incident like tsunami
2. You need to gather *ante mortem* (AM) pre-death data about the missing presumed dead
3. You need to gather *post mortem* (PM) data from recovered bodies
4. You need to match AM and PM data

Lists compiled mainly by foreign ministries – who with help of police have to determine which reports are actually victims

AM data collected mainly by police
PM data collected by forensic scientists and police – including pathologists, odontologists, fingerprint specialists
Finaly specialists match the data done by police and forensic specialists – pathologists, odontologists, fingerprint specialists

Lists had duplications
Lists included many who were not in fact missing
Emails added to duplications
Some reported locally and to foreign ministry
Some data not well collected
9/11 – New York – what part
Israel Goa – reassurance not accepted
UK Guernsey

Canada refused to release names – Denmark did so and cleared up many errors
The Real Problem – AM Data
- If you can find a body or body part it is comparatively easy to gather PM data
- After Swissair 111 crashed into the Atlantic off Nova Scotia – a body part was found and identified for everyone on board – including identical twins – even though bodies were shredded – matching body parts
- Families were offered option – last bits were buried in mass grave
- PM data in short is not the problem – if a body or body part can be found

Tsunami -- AM Problems
- Too much faith in DNA – only about five per cent of bodies identified through DNA
- Police assigned to gather AM data did not always do a good job
- Dead included siblings – hard to know who had used which tooth brush
- Some data not valid e.g. when “father” is not the father
- Children often leave behind little AM data –

Swissair 111

Tsunami – Three Realities
- Thailand – matches were found for most victims – after a slow start
- Sri Lanka – matches were found for most Europeans – after investigation, court orders and exhumations
- A few Sri Lankans were also identified
- Indonesia – whole villages wiped out, no AM data, mass graves the only solution
- But tsunami was start of something else

Bali Bombing

Dead in Bali
TTVI was a co-operative venture
34 counties agreed they would work together – on all bodies – Australia initially took lead in Thailand – UK in Sri Lanka (TTVI did processing for both countries.)
All data would be shared
ID would be based on only three criteria – fingerprints, dental records, DNA
Everything else would be only corroborative
Final approval police in Thailand, coroner in Sri Lanka

Many of those involved had experience with mass death
Canadians – Swissair fingerprints, pig farm – odontology, Norwegians, Scandinavian Star, Swedes, Estonia, Danes, Roskilde crowd crush, Israelis suicide bombings etc.
Most knew each other through meetings of Interpol’s Disaster Victims Identification DVI committee – which meets regularly in Lyons and occasionally elsewhere (Madrid)
Dental records – some better than others e.g. Scandinavian tend to be reliable, also long – tradition of cooperation with police
US records tend to be partial – dentists don’t always record what was done by previous dentist
British now sometimes go to Poland for less expensive dental work – no one may know where records can be found
Israelis easier to identify – pre-death AM data excellent – military service required except for Orthodox – records made available

First have to find some – many persons have never been fingerprinted
Juvenile records may not match – hand now bigger
Locating some requires ingenuity – locked diary, finger painting
Post mortem prints also an issue – epidermis off, dermis gives wrong size – some solutions but some body bags had more than one epidermis off hands

Since police collect all sorts of data to allow identification of dead this raises other issues
It means the police – who may never have had any information about someone – now have all kinds of records on file – including medical records
A person who has never ever come to police attention is now the subject of a major police investigation
And that investigation may turn up things that no one ever wanted known – such as the fact the supposed father was not the father
Mass death can lead to secrets becoming known that would never have been known otherwise – yet families cooperate because they want loved ones identified

Conflicts between police and pathologists – police argued cause of death was usually obvious and identification was being based on dental records, fingerprints and DNA so full autopsies were not necessary
Different after combat or crash when autopsy date may be needed to learn about better equipment or as evidence in criminal proceedings.

There was also conflict among pathologists
A Finnish pathologist complained that some of her colleagues were doing things to the bodies that were insensitive and unnecessary.
After discussion the persons from one country were expelled and others were put on notice.
The British were also super sensitive because of an incident involving a pleasure cruise aboard Marchioness on the Thames.
My colleagues and I have just finished a study of Canadian mass death incidents. Some of what happened after the tsunami happened in Halifax after 1917 explosion. It happened in Darwin, Australia after Cyclone Tracy. It happened in Kobe, Japan after the earthquake there. Individuals picked up bodies in all those places and took them to schools and temples and other public buildings. Just as they picked up casualties and took them to medical centres after 1987 Edmonton tornado. However until mid 20th century there were major differences as well.

Up to the middle of last century bodies were recovered and laid out and identified by those who knew them - fellow workers, local GP, family members. Woman identified son by repair shirt, man brother - part of ear missing. After Halifax explosion people walked along rows of bodies looking for a missing relative. Inevitably many were not identified - sometimes no one was left who was looking for them. In 1949 after Noronic fire (cruise ship in Toronto harbour) forensic were used - FBI supplied fingerprints - one funeral in Detroit had to be stopped. Forensics also used after Harvard trainer and TCA plane collided over Moose Jaw.

Thought we had found a pattern - wrong! 1982 - Ocean Ranger - visual and things on the bodies. 1985 - Air India largely visual some forensics - odontology, fingerprints - one error. 1986 Hinton train derailment Alberta - largely forensics - including anthropology, medical records. But 1987 Edmonton tornado - visual again - even though fingerprints were available - yet same jurisdiction just one year later. 1998 - Swissair 111 - all DNA. 2004 - Indian Ocean tsunami - DNA good for only about five per cent, visual, fingerprints, dental records - but only some visual identifications - some of which were wrong.

Whether forensics are used or not identification has become much more formal, much more controlled. ID done by police, relatives pushed aside - must wait. Previous research - Quarantelli, Hershiser, Blanshan - all from DRC - all done after more controlled approach to handling dead - Same for Vanderlyn Pine - Sociologist and funeral director. Our Historical approach was able to document change over time - and the fact that it is forensics if necessary, not necessarily forensics.

Mass death now sometimes involves high tech - DVI System International, AFIS. Sometimes involves DNA. But still in many cases informal. In short, it seems to be forensics if necessary, not necessarily forensics.
Welcome comments, suggestions about our current research – either now or later or by email

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Scanlon, Joseph (1998) “Dealing with mass death after a community catastrophe; handling bodies after the 1917 Halifax explosion” Disaster Prevention and Management Vol. 7 No. 4 pp. 288-304

Thought that was it – my brief exposure to mass death

Scanlon, Joseph (1999) “Dealing with mass death after a community catastrophe; handling bodies after the 1917 Halifax explosion” Disaster Prevention and Management Vol. 7 No. 4 pp. 288-304


I mention that to illustrate how many spin-offs there can be to a research project – doing grounded research is not simply testing an hypothesis


A Few Other Sources


Research Gap

Do the findings from disaster death apply to pandemic death? At first glance – no!

Pandemic victims are known, cause of death is not suspect
Disaster victims known, cause of death often issue – Air India, Pam Am 103
Pandemic victims die in a health care setting or at home
Disaster victims can die anywhere – even in the Atlantic Ocean (Swissair, Ocean Ranger, Air India)
Pandemics affect emergency personnel – most disasters do not
In a pandemic, normal death rites may have to be abandoned church services banned during Spanish Flu
After a disaster there is no danger of people gathering for funerals or wakes
Disaster mass death plans are usually prepared by police based on model developed by Interpol – control of site, photograph and mark dead, collect AM data, do ID, relatives must wait

Pandemic death planning is found in an ANNEX of the Canadian Pandemic plan, prepared by Public Health Agency

Because cause of death is not an issue, pandemics will not involve coroners or inquests or police investigations

Given differences separation seems logical

1. Easier if list or manifest available
2. Easier if numbers are small
3. Easier if bodies are not deteriorating
4. Easier if bodies are being recovered slowly
5. Easier if bodies all in one place

1. No manifest or list
2. Hundreds of thousands dead
3. Bodies were rapidly deteriorating
4. Bodies were being rapidly recovered
5. There was widespread distribution of bodies
All five problems were present

1. No manifest or list
2. May be thousands of dead – greater than any domestic disaster
3. Bodies are rapidly deteriorating depending on time of year
4. Bodies are being rapidly recovered
5. Country wide distribution
All five problems will be present
I believe separate planning makes little sense – especially since “all hazards” approach is the norm in emergency planning

In both, the flow of bodies into the system is steady – not all at once (Oklahoma City, 9/11, Air India)
In both, collection an issue (persons even entire families may die at home)
In both, paper work is massive
In both, handling dead is demanding – funeral directors, crematoriums overloaded, shortage of persons such as grave diggers,
Both there may be cultural issues – objections to embalming, photographing the dead, use of coffins