IN THE CORONERS COURT OF VICTORIA
AT MELBOURNE

IN THE MATTER OF:
Inquest into the deaths of residents of the Broughton Hall Nursing Home

(Coroners Case No. 1399/07)
(Coroners Case No. 1397/07)
(Coroners Case No. 1371/07)
(Coroners Case No. 1423/07)

INTERIM RULING ON CAUSES OF DEATH

Introduction:

1. In or around the first week of April 2007, there was an outbreak of gastroenteritis at Broughton Hall Nursing Home "Broughton Hall". Each of the above-named deceased were residents of the Broughton Hall nursing home at that time. It is estimated that approximately 22 out of the 30 residents of the Nursing Home at that time contracted gastroenteritis. Upon commencing this investigation, initially, 6 deaths of residents of Broughton Hall Nursing Home in or around this time were reported to the Coroner. After further material was gathered and submissions received with respect to 2 of those 6 deaths, rulings were made that those deaths were not connected to this outbreak and that the deaths were not reportable to the Coroner. Consequently, the investigations into those two deaths were discontinued.

2. Counsel for Broughton Hall, Mr Noonan SC indicated at the commencement of this inquest that his client did not accept that the deaths of the four residents (named above) were causally connected to the outbreak of gastroenteritis. Thus, it was agreed that a sensible way to go about this inquest was to deal with this issue first and hear evidence and make rulings as to the causal connection with the deaths of each of the above named before proceeding to deal with the circumstances surrounding the deaths.

Test

3. Articulating the test for causation was the subject of submissions by both Counsel Assisting and Counsel for Broughton Hall. It is not contentious that the standard of proof for reaching conclusions on a matter upon which the court is required to make a formal finding, such as cause of death, is the balance of probabilities.[1] Counsel Assisting submitted that the test to be applied in this instance may be the one found in *R V Hallett*[2] that is, that the salmonella pathogen was sufficiently and substantially so connected with the death that it can be said to be **a** cause of the death. Counsel for Broughton Hall submitted that it is the "but for" test as found in *March v Stramere.*[3]

4. It is important to keep this question focussed in the coronial context, as distinct from the civil and criminal law. The South Australian Supreme Court recently considered the

[1] This test, in this jurisdiction is applied to the accepted Briginshaw standard (See *Briginshaw v Briginshaw* (1938) 60 CLR 336
[2] [1969] SASR 141
[3] *March v Stramere Pty Ltd* (1991) 171 CLR 506

question of cause of death in a coronial setting. In *Saraf v Johns*[4] His Honour, Justice Debelle at paragraph 18 stated as follows:

> *.....The cause of death is a question of fact that must, like causation in the common law, be determined by the application of ordinary common sense and experience: March v E & MH Stramare Pty Ltd [1991] HCA 12; (1991) 171 CLR 506 per Mason CJ at 515 and per Deane J at 522; WRB Transport v Chivell (1998) 201 LSJS 102 per Lander J at 106; Commissioner of Police v Hallenstein [1996] 2 VR 1 at 17. See generally I Freckleton, Causation in Coronial Law (1997) 4 JLM 289 at 291-292. In undertaking that task the Coroner* ***is not limited by concepts such as "direct cause", "direct or natural cause", "proximate cause", causa sine qua non or the "real or effective cause"(my bolding):*** *cf WRB Transport v Chivell (ibid). The same principles apply mutantis mutandis to other prescribed events that might be the subject of an inquest.*
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> *19. Although the Coroner is to apply common sense and experience to the task of finding the cause or circumstances of a reportable death or other prescribed event the subject of an inquest, there remains the possibility that reasonable minds may reasonably disagree as to the cause. One problem with common sense is that it is not all that common. That is an inevitable consequence of the unfortunate fact that opinions sometimes differ as to what is the common sense of the matter. In the case of the cause of a death, reasonable medical practitioners might reasonably disagree. Another factor is that a medical practitioner or other person might consciously or sub-consciously seek to determine the real or proximate cause while another may have regard to the causa sine qua non or some other aspect of "the logical and metaphysical controversies that beset the idea of cause" to use the words of Sir Frederick Pollock quoted by Windeyer J in Timbu Kolian v The Queen [1968] HCA 66; (1968) 119 CLR 47 at 68-69; see also Windeyer J in National Insurance Co of New Zealand Ltd v Espagne [1961] HCA 15; (1961) 105 CLR 569 at 590-596.*

5. In applying common sense to this question, it must be said that legal reasoning to reach conclusions about causation in formulating medical or scientific causes of death, warrants at least some consideration of the way in which the international framework for the provision of authorised death certificates has been developed for doctors. The authorised death certificate used in Victoria and based on international standards, is divided into parts and acknowledges that a death may have competing primary and competing underlying causes. It would not be common sense for the law to ignore the way in which this international framework for the provision of authorised death certificates has been developed to accommodate medical science and medical reasoning.

6. Extrapolating from His Honour Justice Debelle in *Saraf v Johns*, causal connection will be a question of fact in each case as to whether there can be said to be a nexus between the cause of death and the salmonella outbreak. Endeavouring to distill the essence of where the authorities are on this issue in this jurisdiction, taking into account what has emerged from *Saraf v Johns*, in my view, if I am satisfied that salmonella gastroenteritis played a sufficient and material part in the death under investigation to warrant being acknowledged by a reasonable and competent medical practitioner on the death certificate as a contributing cause, then that finding should form part of the entry on the death certificate. That being so, that death should remain in the investigation given the background to this investigation and its nature and purpose.

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[4] *Saraf v Johns* [2008] SASC 166; 92008) 101 SASR

Background

7. A considerable number of medical experts gave evidence on this issue. The treating GP's, locums who attended upon the patients at the relevant time, three court appointed experts in their fields Professor Grayson, an infectious disease expert, Dr Demeduik an experienced GP and Dr Myers a geriatrician and Associate Professor Hammond who was engaged by Broughton Hall to provide an opinion on this issue.

8. The weight of medical opinion was that findings as to the medical causes of death of each of the above named must be assessed in the context of their individual co-morbidities, their age and general condition at that time and the significance of being in a nursing home during an outbreak of gastroenteritis. Dr Myers[5] gave evidence that elderly patients in nursing homes are at particular risk of outbreaks of infectious diseases as a result of their general frailty and compromised ability to respond to infection as a result of their co-morbidities and the closed nature of the environment.[6] Dr Demeduik agreed with this as did Professor Grayson[7].

9. Professor Grayson's evidence was that these patients are particularly at risk of picking up viral and bacterial pathogens for a range of reasons including that they are often on medications or treatments which reduce the body's natural ability to fight infection and also lower the threshold for contracting infection.[8] He also gave evidence that the consequences of contracting the infection for elderly patients are more dire as their resilience to the fluid loss as a result of vomiting and diarrhoea is significantly reduced. He noted that elderly people with co-morbidities are at higher risk of the salmonella spreading from the gut into the bloodstream and into the other organs.[9]

10. It is not contentious that there was an outbreak of gastroenteritis commencing approximately in or around early April 2007 at Broughton Hall Nursing Home. I turn now to consider the facts of each of the above named individuals remaining in this inquest in order of the dates upon which they passed away.

P N Coroners Case No 1399/07

11. Mr P N was born in 1932. He developed multiple sclerosis just after his fortieth birthday. He was an advertising manager at that time. By 1993, after a cerebral vascular accident (CVA) he was permanently right side paralysed. By early 1994, he was no longer able to live independently and was admitted to a nursing home. In July 2001, he was transferred to Broughton Hall where he remained until his death on April 8, 2007.

12. **Submissions on medical cause:** Counsel Assisting set out a very helpful summary of the evidence and submitted that there were no post mortem examination results to rely upon but there were circumstantial pieces of evidence which could only be relied upon if satisfied to the proper standard. Counsel for Broughton Hall submitted that there was no objective evidence that Mr P N was affected by salmonella typhimurium and further that the state of the opinion evidence in support of a finding of contribution was such that it did not reach the *Briginshaw* standard for cause or contribution. Counsel for Broughton Hall submitted

[5] Geriatrician engaged by the Court.
[6] TS: 400
[7] Head of Infectious Diseases at the Austin Hospital and engaged by the Court to provide an independent expert opinion.
[8] TS: Pp 544-5
[9] TS: 546

that I should find that the probable cause of death for Mr P N was a fatal stroke or a coronary event given the progressive nature of his underlying vascular disease.

13. Mrs S N, the wife of the late Mr P N, attended the directions hearing and indicated that she wished her husband's death to be included in the cluster of investigations. It was her view and her evidence that Mr P N did not suffer a CVA as postulated by Dr Hall in the death certificate. It was also her view expressed from the body of the court that she had not known of the gastro outbreak at Broughton Hall at the time of her husband's death. No testing of him was done prior to him being cremated.

14. **Discussion of the evidence**

15. Dr Lynn Hall was Mr P N's treating GP for the last 20 years of his life. However, she did not attend upon him or examine or treat him over the Easter 2007 weekend when he became unwell as Dr Hall was away at that time. Dr Hall provided three statements and gave oral evidence.[10] She set out Mr P N's medical history which included a sarcoid of one eye causing it to be enucleated, a history of megacolon requiring trips to hospital for bowel torsion and bowel obstruction together with his multiple sclerosis causing weakness, lethargy and frailty and a previous stroke. She noted that he was mentally intact and could express his will despite his limited ability to communicate beyond "yes" and "no". Dr Hall maintained routine monthly visits to Mr P N. She last attended him on March 22, 2007 and stated that she found his general health unremarkable at that time. She did not see him alive again.

16. Over the Easter weekend Mr P N was observed by the nursing staff to have become unwell. A locum service doctor (Dr Gunaratne) attended upon Mr P N. Dr Gunaratne attended upon Mr P N on April 7, 2007 at which time he was told by the nursing staff that Mr P N had had a large bowel motion and had vomited a few times. After examining him, Dr Gunaratne reached a diagnosis of viral gastroenteritis.[11]

17. Although Dr Hall had not examined Mr P N proximate to his death, she wrote the death certificate for Mr P N. She stated[12] that she reviewed the clinical notes for Mr P N prior to writing his death certificate. She wrote his death certificate on April 11, 2007 indicating his cause of death as a CVA in a setting of a viral illness of 2 day's duration. Dr Hall stated that at the time she wrote the death certificate she did not know there was an outbreak of gastroenteritis at Broughton Hall. She further stated that she did not think knowledge of the gastroenteritis outbreak would have changed her certification as she concluded that, given his history, he "probably had a CVA"[13].

18. Mr P N did not undergo any postmortem examination, nor were any samples collected from him for testing.

19. During questioning about how she had formulated her cause of death, Dr Hall stated that Mr P N had not seemed unwell enough to have died from the noted gastro symptoms. She

[10] Exhibit 9 and TS: 195 - 208
[11] Dr Demeduik as the nominee of the RACGP provided evidence that the symptoms of Salmonella gastroenteritis include diarrhoea, abdominal cramps, fever nausea, and/or vomiting. (See Exhibit 19)
[12] Statement of 6.6.07 Exhibit 9
[13] Exhibit 9

stated that "*I assumed from a medical point of view that he had became unwell and had a further – a further vascular event.*"[14]

20. The opinions of both Professor Grayson and Associate Professor Hammond as to the possible cause of death of Mr P N and the contribution of the gastroenteritis to it were put to Dr Hall. Professor Grayson's opinion was that although the role of salmonella typhimurium was uncertain in the death of Mr P N it was likely to have contributed to his death given the clinical diagnosis of a gastro illness, although Professor Grayson was unable to determine the exact contribution. Dr Hall accepted this opinion as quite reasonable.[15] Associate Professor Hammond provided an opinion that there was a significant likelihood that Mr P N's death occurred due to either cardiac or cereberovascular causes unrelated to any suspected viral or bacterial illness. Dr Hall responded to this by stating this was possible.[16] Dr Hall also stated that she thought the clinical notes indicated a fairly mild illness and she also noted that the description of his bowel actions could have been part of his underlying condition or accentuated by his underlying medical condition.

21. However, Dr Hall considered the underlying viral illness noted by Dr Gunaratne as significant enough to put into the death certificate. When questioned about why she did that she stated that his clinical notes did indicate that he had a viral illness preceding his death and "*so it seemed right to put that into the death certificate*".[17] She ultimately agreed that her death certificate was pure speculation both as to the CVA and as to whether or not the viral illness contributed to Mr P N's death.

22. Mrs S N made a statement[18] and gave evidence about her husband's condition in the lead up to his death. She was clearly very attentive and caring to her husband and whilst noting that she held no medical qualifications she rejected the notion that her husband had had another stroke and held this view on the basis that she knew her husband and had been observing him for a long time. She was advised by the staff on April 7 that Mr P N was having an "off day". Mrs S N noted that her husband seemed subdued and could not be tempted to eat his favourite food, banana.[19]

23. The doctor was called by the nursing staff as a result of the constellation of recorded symptoms detailed to Dr Gunaratne. There was no evidence that any of the experienced staff at the nursing home considered that Mr P N had had a stroke or cardiac event.

24. Dr Gunaratne, upon attending and examining Mr P N reached a working diagnosis of viral gastroenteritis. He stated that he reached this diagnosis as a result of finding his patient with nausea, vomiting, low grade fever and a few bowel motions. He went on to say that he did not expect Mr P N to die from his condition in such a short period unless he had severe diarrhoea which created an electrolyte problem or he had other medical causes for his death.[20] Dr Gunaratne confirmed that he did not observe Mr P N to be dehydrated and that he was alert and co-operative with blood pressure and heart rate stable and satisfactory.

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[14] TS 198
[15] TS 199
[16] TS 200
[17] TS 207
[18] Exhibit 2
[19] TS 68
[20] TS 106-8

25. Counsel for Broughton Hall submitted that Dr Gunaratne "considered" that Mr P N may have had a respiratory infection. This was a proposition put to Dr Gunaratne during cross examination but he clarified this had not been his **diagnosis,** but rather a consideration and he remained of the view that viral gastroenteritis was his working diagnosis.

26. Dr Gunaratne accepted, along with the other doctors who gave evidence, that Mr P N, given his history *could* have died of a further vascular event as postulated by Dr Hall. In my view when endeavouring to weigh up the evidence, it is most significant that Dr Gunaratne was the only doctor who gave evidence to the inquest who actually examined Mr P N proximate to his death. He was an experienced emergency physician. When asked as to whether or not he found any evidence of a CVA when he examined Mr P N, he said he did not.

27. Dr Demediuk was a nominee of the Royal College of General Practitioners. He was requested to provide an independent opinion to the court. He provided a statement [21] and gave evidence at the inquest. Dr Demeduik stated in evidence that there was no objective evidence in existence that Mr P N was infected with salmonella but there was evidence of his gastrointestinal complaint.[22]

28. Dr Myers expressed the view that Mr P N died in his sleep, possibly of an arrhymthmia or myocardial infarction. When asked in evidence about the role played by any salmonella gastroenteritis, Dr Myers effectively concluded that without post mortem findings it was not possible to conclude what role it played in his death, but Dr Myers made it clear that looking at the bigger picture at the time with the benefit of hindsight as to the outbreak, whilst it cannot be proved he would have suspicions that the death was related to the outbreak.[23] He stated that Mr P N was at high risk because of his general medical condition so that even if the mechanism of death was a myocardial infarction that does not exclude gastroenteritis as an antecedent cause.[24]

29. Associate Professor Hammond [25] postulated from the medical notes that he was not able to exclude the possibility that Mr P N suffered from gastroenteritis but he also concluded that Mr P N's death may have occurred unrelated to any viral illness, noting that his death may have occurred as a result of a CVA or an acute coronary event. Associate Professor Hammond concluded that "there is a significant likelihood that Mr P N's death occurred due to either a cardiac or cerebral cause" with no convincing evidence connecting his death to the salmonella outbreak.

30. Professor Grayson, whilst stating that it was impossible to say whether Mr P N had salmonella, expressed the view that Mr P N appeared to have an intestinal illness that was different to the condition he had been in prior to April 7, 2007 such that the nursing staff were moved to call the doctor. Professor Grayson concluded that given the outbreak and given Dr Gunaratne's clinical examination and diagnosis, it was likely that salmonella played a role in Mr P N's death but conceded there was no evidence he **definitely** had salmonella.

31. Counsel for Broughton Hall submitted that Mr P N's bowel charts demonstrated that he had previous periods of loose bowel actions and thus nothing could be concluded from the

[21] Exhibit 19
[22] TS 366
[23] TS 395
[24] TS 399
[25] Exhibit 21

descriptions of bowel movements relied upon by Dr Gunaratne. However, as previously stated, Dr Gunaratne whilst conceding a number of possibilities and risk factors for Mr P N, he did not move away from his working diagnosis during his evidence.

32. Dr Hogg[26] concluded that Mr P N's death was consistent with salmonella gastroenteritis and that there was no other evidence that any particular illness or condition caused his death.

Conclusion as to Mr P N's cause of death

33. There was an outbreak of salmonella gastroenteritis at Broughton Hall at the time of Mr P N's death. The weight of the expert evidence is that for patients as complex and frail as Mr P N, a resident of a nursing home, he would be particularly susceptible to infectious outbreaks such as gastroenteritis.

34. The experienced nursing staff at Broughton Hall, very familiar with Mr P N's history noticed a change in Mr P N's condition sufficient to call a doctor to examine him.

35. Mrs S N also noticed a change in her husband when she visited him, noting him subdued and lethargic.

36. Dr Gunaratne, although working as a locum on this occasion is an experienced emergency physician. He was the only medical expert who actually had the opportunity to clinically examine Mr P N and did so proximate to his death. He diagnosed Mr P N with a viral gastroenteritis although he did not consider him unwell enough to be at risk of death. However, he did not resile from his diagnosis in evidence. Further, he stated that he did not find evidence of a CVA on his clinical examination of Mr P N. In my view, the benefit of being the only doctor to have examined Mr P N proximate to his death gives his opinion significant weight when measured against the other experts.

37. Dr Hall wrote the death certificate for Mr P N and included "viral ill" in that death certificate as an antecedent cause. She did so because as a very experienced doctor, given it was in the clinical notes as a result of the last doctor who examined him, she stated that "it seemed right to put that in the death certificate". I take this to mean she understood her obligations when completing a death certificate that she was required to include not just the primary cause but any underlying conditions that may have contributed in a medical sense. She made this entry based on Dr Gunaratne's examination and diagnosis. She otherwise "assumed" that Mr P N had died primarily of another CVA because that had been his history and therefore he was at risk of another such event.

38. No testing was ever done to establish the aetiology of the gastroenteritis diagnosed by Dr Gunaratne. There is no microbiological evidence that Mr P N had contracted salmonella gastroenteritis. However, once satisfied, as I am, that he was suffering from gastroenteritis at the time of his death, I am also satisfied that it is more probable than not that the gastroenteritis Mr P N was suffering from was from the same pathogen the other three persons in this inquest were suffering from. The submission that I cannot conclude that it was salmonella gastroenteritis as there was no microbiological testing done does not properly represent the application of common sense required in the area of causation in the coronial jurisdiction. Mr A T and Mr M D and Mrs T H were all found to have the salmonella pathogen on post mortem examination. I am satisfied that it is more probable than not that the viral gastroenteritis diagnosed by Dr Gunaratne on examination of Mr P N

[26] TS 640

was caused by the same pathogen which infected Mr A T and Mr M D and Ms T H, given the timing of each of their illnesses and the highly infectious nature of the salmonella pathogen in the closed environment they were in.

39. Professor Grayson, the independent and indeed only expert in infectious diseases to give evidence stated that it was likely that salmonella played a role in Mr P N's death.

40. Whilst there was learned medical opinion from Dr Myers and Associate Professor Hammond that Mr P N probably died as a result of a stroke or a cardiac event given his history, Dr Myers did state that this does not exclude the gastroenteritis as an antecedent cause whilst Associate Professor Hammond was more circumspect noting there was no convincing evidence connecting his death to the outbreak although he could not exclude the possibility. In other words, these doctors in varying degrees did not exclude the gastroenteritis as a contributing cause to Mr P N's death. However, as stated above, they did not have the benefit of clinically examining him as did Dr Gunaratne.

41. In my view, it is reasonable to conclude on the basis of the evidence that immediately prior to his death, Mr P N had a gastro illness that was sufficient to make him feel unwell, and to raise sufficient level of concern amongst the nursing staff to call for the doctor and for Mr P N to exhibit clinical symptoms of gastro enteritis. There are no certainties available in the case of Mr P N, but certainties are not required.

42. For the above reasons, I am satisfied on the balance of probabilities that at the time of his death, Mr P N in his frail and vulnerable state with his multiple co-morbidities was suffering from gastroenteritis which more probably than not was caused by the same pathogen found in the other three persons the subject of this inquest. I do not conclude that the salmonella gastroenteritis was the sole cause of Mr P N's death as the evidence does not support such a conclusion, but given my findings, I am satisfied that it is likely to have played a material and sufficient role as an antecedent contributing cause to his death. Therefore it is appropriate to maintain the investigation into his death as part of this inquest.

A T Coroners Case No. 1397/07

Mr A T was born in 1911 and died on April 11, 2007 at the age of 95. Like the other residents of the nursing home under consideration in this inquest, Mr A T was elderly and frail and suffering from a range of complex medical problems. Upon his death, his treating GP Dr Colin Davidson wrote a death certificate for him stating that he died from cachexia secondary to carcinoma of the colon with associated gastric obstruction.

43. **Submissions on medical cause**: Counsel Assisting submitted that it was open to the Court to find on the evidence that Mr A T's death was contributed to by the salmonella pathogen. The daughter of Mr A T, Ms D B advised that she did not consider her father's death to be connected to the salmonella outbreak and did not wish for his death to be included in this investigation. It was the submission of Counsel for Broughton Hall that Mr A T's death was imminent and that his decline in the last few days was consistent with the cause of death provided on his death certificate by his treating GP Dr Colin Davidson. Counsel for Broughton Hall submitted that, relying on Dr Davidson's evidence, I should find that salmonella played no role in the death of Mr A T.[27]

[27] Written submission for Broughton Hall. P 18

Discussion of the evidence

44. On April 10, 2007 a locum doctor was called to Mr A T. Whilst that doctor has not been able to be identified from the notes kept by Broughton Hall, it is not contentious that the doctor was called as a result of **an increase in vomiting** and that he was vomiting a greenish fluid. The locum doctor made a diagnosis of gastroenteritis and ordered a maxolon injection for Mr A T. Despite this, Dr Davidson was notified of an increase in vomiting overnight **and** an episode of diarrhoea on the morning of April 11, 2007. By the time Dr Davidson visited Mr A T on April 11, he found him unconscious and by 5.30pm he had passed away.

45. It was submitted by Counsel for Broughton Hall that Mr A T vomited frequently as a result of his underlying condition. This is borne out by the notes but the reason for the calling of the locum on April 10 was as a result of an increase in vomiting. This action must also been seen in the light of a staff that were well aware of Mr A T's underlying condition and apparently noted a change sufficient to call the doctor.

46. Dr Michael Burke, forensic pathologist conducted a partial autopsy upon Mr A T and prepared a post mortem report in which he concluded that Mr A T had died from complications of salmonella gastroenteritis.[28] Dr Burke noted that microbiology culture results from both the small and large bowel of Mr A T found the presence of salmonella typhimurium. [29]Dr Burke in evidence stated that the role the salmonella played in the death of Mr A T was uncertain in that he could not quantify by how much it might have hastened his imminent death.

47. Dr Colin Davidson had been treating Mr A T regularly from 1998. Dr Davidson prepared two statements for this investigation. In the first one,[30]he set out the range of Mr A T's medical problems which included hypertension, chronic lung disease, osteoarthritis and renal failure. In January 2007, following a diagnosis of cancer of the colon, he had a right hemicolectomy, gastrenterstomy and repair of his duodenum. In the wake of this surgery, the prognosis for Mr A T was poor. During his post operative recovery, he developed gangrene of his right heel. He underwent a femeropopliteal bypass operation to improve his circulation. Dr Davidson noted that Mr A T's general condition improved slightly and very slowly, whilst noting that he had persistent vomiting and continued weight loss related to an obstruction in his upper gastrointestinal tract. Dr Davidson noted that he had intermittent vomiting and general deterioration of his condition up until the date of his death. Dr Davidson was also very clear that the care that Mr A T received at Broughton Hall was excellent in his view.[31]

48. Dr Davidson, in his first statement indicated that whilst he was advised about the outbreak of gastro in the nursing home at the time of Mr A T's death, he believed it to be co-incidental to Mr A T's death. Dr Davidson wrote a death certificate for Mr A T stating that his cause of death was cachexia secondary to gastric obstruction following complications of cancer of the colon.[32]

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[28] Exhibit 17
[29] TS 292: Dr Hogg
[30] Exhibit 11: Statement of June 13, 2007
[31] TS 221
[32] Exhibit 12

49. Dr Davidson was asked to prepare a second statement addressing the post mortem finding of salmonella in samples from Mr A T's gut. He noted, in that second statement that he remained unchanged in his view about the primary cause of the death of Mr A T, but went on to state that ....."*Clearly, the finding of Salmonella in samples from Mr A T's gut raises the realistic possibility that the outbreak of gastroenteritis in the nursing home was a contributory factor in his death. The occurrence of diarrhoea prior to Mr A T's demise would support this possibility. However, Mr A T's death was imminent in any case and I am not able to say whether the Salmonella infection was a major cause or an incidental, contributory factor at the last.*"[33]

50. Medical records for Mr A T reveal that a locum was called on 10.4.07 to the nursing home and made a diagnosis of gastroenteritis and recommended the transfer of Mr A T to hospital. However, following discussion with the family, this did not happen. Dr Davidson made it clear in evidence that when he attended Mr A T the following day he did not see any note from a locum doctor visit. He frankly noted that given that Mr A Ta was in the last stages of life he did not think he would have paid particular attention to that detail.[34] He confirmed in evidence that whilst the presence of salmonella in the gut identifies it as a possible contributory factor, but for Mr A T, it could only have been a small contributory factor.

51. He also stated that the locum may not have looked carefully at Mr A T's history of vomiting and assumed his diagnosis of gastroenteritis if the locum had been advised of other cases in the nursing home. However, the staff saw fit to call a locum to Mr A T and that locum made the diagnosis and the microbiology findings support that diagnosis.

52. As with the other deaths under consideration in this investigation, a number of medical experts examined the medical records and prepared opinions and gave oral evidence touching upon the cause of death of Mr A T and the relevance if any, of the finding of salmonella in the large and small bowel of Mr A T.

53. Counsel Assisting has prepared a useful written summary of the range of medical opinions which emerged from the evidence to date with respect to Mr A T from paragraphs 28 to 41 of the written submissions. I adopt that summary as an accurate and useful summary of the range of expert views and opinions provided to date on this issue.

54. It remains to assess the weight and value of those views and come to a conclusion.

55. The point at which I commence is that salmonella typhimurium was found in the small and large bowel of Mr A T on post mortem examination. That is, Mr A T had been infected with the salmonella by the time of his death. Mr A T was a very ill man whose death was described as imminent by his treating GP. This description was adopted by Associate Professor Hammond.

56. Dr Myers effectively agreed with the cause of death on the death certificate, but added that his death had occurred in the setting of a septicaemia caused either by peritonitis or salmonella. [35] Dr Myers added that he thought Mr A T may have contracted peritonitis from an abscess. Dr Burke conducted the autopsy and did not make such a finding. Further, Professor Grayson's opinion on this issue was that such a possibility was unlikely given that

[33] Exhibit 11 Statement of December 17, 2009
[34] TS 212
[35] TS 406

peritonitis would be a very obvious diagnosis in a patient given the onset of pain and acute illness and such a diagnosis was not made. Given the findings of Dr Burke who performed the autopsy and Professor Hammond's reasoning as to the likelihood of peritonitis, I do not accept this theory of Dr Myers. I add that no other medical witness suggested such a possibility.

57. Dr Hogg, a highly qualified and experienced microbiologist, the Director of the Microbiological Diagnostic Unit attached to the University of Melbourne made it clear in his evidence that the presence of the salmonella found in the small and large bowel of Mr A T was an abnormal finding.[36] He also observed that other pathogens and viruses were searched for and none found.

58. I was greatly assisted by Professor Grayson. Given his background and relevant experience and position as Head of Infectious Diseases at the Austin, where there is a conflict of opinion as between Professor Grayson and Associate Professor Hammond as to the effect of salmonella, given that Associate Professor Hammond does not assert the same level of expertise in infectious disease, I rely upon the opinion of Professor Grayson. I note that Dr Davidson was also prepared to defer to the opinion of Professor Grayson.

59. Professor Grayson concluded that the salmonella found in the bowel of Mr A T most likely contributed to his death for the reasons he provided in his evidence which included an apparent more rapid deterioration in Mr A T, the episodes of vomiting and diarrhoea such that the doctor was called to Mr A T, that the examining doctor diagnosed gastroenteritis and recommended hospital for Mr A T, and that there were post mortem findings of salmonella in the large and small bowel of Mr A T. Importantly, Professor Grayson noted that, given Mr A T's condition, earlier identification of the salmonella outbreak at Broughton Hall would probably not have altered the outcome for Mr A T, especially given the family wish not to seek active treatment.[37]

60. Associate Professor Hammond expressed the view that Mr A T died of a cardiac arrhythmia. It was also his evidence that the clinical observations of Mr A T with vomiting and diarrhoea on his last day, coupled with the finding of salmonella in his gut suggest that he did suffer from gastroenteritis during the 24 hour period prior to his death, but that the role that it played was uncertain.[38] Dr Davidson, like Dr Burke noted that the heart obviously stops at some point leading to death but how it stops is purely speculative unless one had an ECG running at the time.[39] Dr Davidson gave evidence that he did not put that on the death certificate as he considered that to be "speculative".

Conclusion as to Mr A T's cause of death

61. Given the evidence, I find on the balance of probabilities, the episodes of vomiting and diarrhoea clinically observed in Mr A T in the 24 hours prior to his death and diagnosed by a locum doctor called in by Broughton Hall as gastroenteritis, was gastroenteritis caused by the salmonella found in his gut upon post mortem examination.

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[36] TS 293
[37] TS 216: This was a view shared by Dr Davidson.
[38] Exhibit 21
[39] TS 219

62. I find that on the balance of probabilities the salmonella typhimurium found in the large and small bowel of Mr A T at the time of his death contributed to the timing of his death in a sufficient and material way to include it in his cause of death as an antecedent cause. None of the medical experts were prepared to quantify what that level of contribution may have been as in whether it hastened Mr A T's death by hours or days. This finding makes it appropriate to maintain Mr A T's death as part of this investigation.

T H Coroners Case No. 1371/07

63. Mrs T H was born on 23 June 1919 and died in Broughton Hall on April 12 2007. She was 87 at the time of her death and had been in the nursing home at Broughton Hall since 2003. Doctor Soccio commenced being her treating doctor at that time and remained so until her death. At the time of her death Mrs T H was suffering from a range of medical conditions including severe dementia, agitation and severe gastro-oesophageal reflux.[40] Mrs T H had also suffered a stroke in 2000. As a result of her dementia, Dr Soccio described her as suffering from faecal incontinence. Dr Soccio's evidence was that she would also suffer from vomiting from time to time caused by her reflux.[41]

64. Mrs T H's death was notified to the coroner as no doctor was prepared to provide a death certificate. Dr Michael Burke, forensic pathologist performed an autopsy and provided bodily samples for microbiological examination. After post mortem examination, Dr Burke concluded that Mrs T H's cause of death was salmonella gastroenteritis.

65. **Submissions on medical cause**: In final written submissions, it was conceded by Counsel for Broughton Hall that the balance of the evidence supported a finding that Salmonella at least contributed to the decline of Mrs T H and that it was open on the evidence to find that the effects of the salmonella infection caused the death of Mrs T H. Counsel assisting in final written submissions submitted that the evidence supported a finding that the salmonella pathogen caused the death of Mrs T H.

Discussion of the evidence

66. Dr Samaddar was called to attend upon Mrs T H on April 7, 2007. He noted that she presented with one bout of vomiting and one soft bowel motion.[42]He did not think she needed to be hospitalized at that stage but had been made aware of other cases of gastro enteritis in Broughton Hall. He did leave instructions to call her GP if her condition deteriorated. He checked her pulse and blood pressure and found them to be within normal limits.

67. Dr Samaddar agreed somewhat reluctantly during cross examination that persons with Mrs T H's history of vascular disease are potential candidates for further stroke which can happen suddenly.[43] His evidence was only as high as it ***could*** happen. He also gave evidence that where an infection such as salmonella gets into the blood system then that would have caused Mrs T H's death quite quickly.

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[40] Exhibit 4
[41] TS 85
[42] Exhibit 6
[43] TS 126

68. Dr Zdanius was requested to attend upon Mrs T H on April 10 and did so. He attended on behalf of Dr Soccio. Dr Zdanius, in his statement[44] noted that he visited Mrs T H again on April 11 and that she died of gastroenteritis about 12 hours after his second visit. Dr Zdanius verified death on April 12 but was not prepared to provide a death certificate on the basis that he was satisfied Mrs T H had died unexpectedly of a notifiable contagious disease being gastroenteritis salmonella which Dr Zdanius described as "a lethal disease in a frail person"[45].

69. Dr Zdanius accepted during his oral evidence that Mrs T H's illness most likely started on April 7 and was resolving when he saw her on April 10. He disagreed with Associate Professor Hammond's opinion that Mrs T H died from a fatal cardiac arrhythmia. He accepted that the "ultimate moment of death" was probably/ possibly cardiac and acknowledged her other underlying medical conditions, but I understood his evidence to be that he would add on her death certificate the salmonella as a contributing cause, as the thing that "tipped her over".[46] His evidence was that the gastro causes general weakening, causes volume reduction in circulation, thickening of the blood, burden on the heart and just general total system failure in a frail 88 year old.[47]

70. Dr Zdanius rejected the proposition that the bronchopneumonia found on post mortem examination was a primary cause of Mrs T H's death, but rather a result of the salmonella infection causing her to be bed bound and lying flat leading to congestion in the base of the lungs.[48]

71. Dr Zdanius also rejected the connection between the coronary artery disease and the post mortem finding of 75% blockage stating it was not a terminal condition and that many people were walking around with 95% blockage.[49]

72. Dr Zdanius described his "firm belief" that the salmonella was the number one cause of Mrs T H's death. At the close of his evidence, when asked whether anything he had heard in evidence or read since forming his view had changed his mind, he stated that he had changed his view about when Mrs T H's illness started in that it had started some days later than he had originally thought, and he now better understood what had caused her sudden decline as a result of the post mortem findings but he had not changed his firm belief that she died of a fulminating infection.

73. Mrs T H's death was reported to the coroner and subsequently Dr Michael Burke, forensic pathologist performed an autopsy. This report was tendered into evidence[50] and Dr Burke gave oral evidence. Dr Burke summarized his relevant findings as: clinical history of dementia; history of other residents in nursing home contracting gastroenteritis; myocardial fibrosis; cardiac amyyloidosis; acute pulmonary oedema; mild bronchopneumonia; mild diverticulosis distal colon; calcified leiyomas uterus and colloid cysts thyroid gland. He provided his opinion as to cause of death as salmonella gastroenteritis.

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[44] Exhibit 7
[45] TS 156
[46] TS 158
[47] TS 158
[48] TS 161
[49] TS 183
[50] Exhibit 17 (3)

74. Microbiological cultures were made during the post mortem investigation. Salmonella Typhurium 44 was found to be present in Mrs T H's leg and heart blood as well as her liver and stomach contents and bowel.

75. Microbiologist Dr Hogg stated that such a finding indicated that the salmonella infection had spread beyond local organs into the bloodstream.[51]On this finding, Professor Grayson stated as follows: "we would generally term it septicaemia or a bacteraemia and to then have that spread to multiple other organs is a further extension of its severity and that was evident from the pathology report. It suggests to me that there was disseminated salmonellosis and in a woman of – such as Mrs T H that this is likely to be a fatal event without treatment."[52]

76. Dr Soccio, Mrs T H's treating doctor last saw Mrs T H two weeks before her death and at that time his evidence was that her condition was quite stable with no signs or symptoms of imminent death present.[53] He agreed that one of Mrs T H's major arteries was significantly occluded and that she would have been susceptible to fatal cardiac events.

77. Dr Soccio also used a reference to "tipping the balance"[54]when responding to questions about Mrs T H's underlying disease together with the gastroenteritis infection. He stated that, given she was reasonably stable last time he saw her and given the dire consequences of salmonella, it "might have been the acute event that precipitated her death."[55]

78. Associate Professor Hammond stated that in his opinion Mrs T H was suffering symptoms of gastroenteritis at the time of her death. He also stated that although her ultimate cause of death would have been a fatal arrhythmia, in his opinion the gastroenteritis was a "materially contributing factor to her death, in that I believe that condition of (Salmonella) gastroenteritis did cause a decline in her general medical status, which set in train a decline in bodily functions, from which Mrs T H was unable to recover." [56]

79. Dr Myers' initial [57]opinion was that Mrs T H was likely to have died from her underlying cardiac illness with the infection from either the lungs or the salmonella being the precipitating factor. When giving oral evidence, the opinion of Professor Grayson was put to him that Ms T H's death was due to overwhelming salmonella typhimurium infection. Dr Myers was asked whether or not he agreed with that opinion and he indicated that he did.[58]

80. Commenting upon the ultimate cause of death of fatal arrhythmia given by Associate Professor Hammond, Dr Davidson, Professor Grayson and Dr Burke all gave evidence along similar lines that to express the cause of Mrs T H's death as fatal cardiac arrhythmia does nothing more than describe the ***mechanism*** of death rather than the contributing causes leading up to the final mechanism.

Conclusion as to Mrs T H's cause of death

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[51] TS 296
[52] TS 563
[53] Exhibit 4
[54] TS 102
[55] TS 103
[56] Exhibit 21
[57] TS 412
[58] TS 422

81. Taking into account all of the above, and given the submissions of Counsel and in particular the concessions from Counsel for Broughton Hall, I am satisfied that the weight of the evidence supports a finding that on the balance of probabilities, that the "overwhelming Salmonella Typhimurium infection" found on post mortem was, notwithstanding her underlying range of co-morbidities the precipitating factor which caused the death of Mrs T H.

M D Coroners Case No 1423/07

82. Mr M D was born on March 28 1923. He was transferred to Broughton Hall from another nursing home in November 2005. Once at Broughton Hall his treating doctor was Dr Celia Sklovsky. Dr Sklovsky summarized Mr M D medical history as including dementia with behavioural problems, hypertension, chronic obstructive airways disease, atrial fibrillation, falling, epigastric hernia and past fractured left hip and knee reconstruction.

83. Mr M D died on April 16 2007 at the Epworth Hospital. His death was reported to the coroner.

84. **Submissions on medical cause:** After the evidence was completed, Counsel assisting in written submissions, having traversed all of the evidence submitted that the clear weight of the evidence was that Mr M D died as a result of the infection caused by the salmonella pathogen. Counsel for Broughton Hall, in final written submissions accepted that on balance, the evidence supported a finding that Mr M D death was caused by or contributed to by the salmonella pathogen.[59]

Discussion of the evidence

85. Mr M D had been attended to by Dr Gunaratne on April 7, for a fall the day before. Later on April 7, he was seen by Dr Liu for vomiting and diarrhoea. By late on the evening of April 7, he was noted to be incontinent of faeces. By April 10 he was recorded as being lethargic and the records contain various entries about Mr M D condition and treatment over the next few days until his transfer to the Epworth Hospital on April 15, 2007.

86. After his death on April 16, he was transferred to the care of the State Coronial Services Centre where he underwent post mortem examination by forensic pathologist Dr Michael Burke. Dr Burke concluded that Mr M D's cause of death was salmonella gastroenteritis.[60] Microbiological testing on post mortem samples taken from Mr M D's proximal small bowel, distal small bowel, stomach contents, large bowel, bile, left lung and blood cultures from his heart and leg were all positive for salmonella. Dr Burke's evidence was that the cause of death from the salmonella pathogen was "obvious" upon his examination together with the clinical history.

87. Mr M D's daughter, Mrs T gave evidence that she received a telephone call from Broughton Hall on April 14, 2007 at which time she was told that her father had gastroenteritis and he was the worst affected.[61]

88. Mr M D was transferred to the Epworth Hospital on April 15 and attended to by Dr Ong at the Epworth. Dr Ong gave evidence that she was informed there was a gastroeneteritis

[59] Written submissions P.35
[60] Exhibit 17 (4)
[61] TS 76

outbreak at Broughton Hall. Dr Dalgleish, at the Epworth, also examined Mr M D. He formed the view that Mr M D was dehydrated and may have had cellulitis and/or a chest infection.[62] Mr M D did not have a further episode of vomiting or diarrhoea at the Epworth.

89. Dr Ong, at the Epworth noted that by April 16 Mr M D had developed "lung crackles". Dr Ong thought Mr M D may have aspirated leading to pneumonia. On behalf of Broughton Hall the issue of the origin of his pneumonia was canvassed.[63]In particular as to whether or not his pneumonia was bronchopneumonia as against aspiration pneumonia. Dr Ong stated in evidence, after being advised of the microbiological post mortem findings, that it would be uncommon to find salmonella on lung swabs unless a patient, infected with salmonella had aspirated. Dr Myers agreed with this view as did Professor Grayson.

90. With respect to the death of Mr M D, given the concessions of Broughton Hall in closing written submissions and the evidence of Dr Hammond, the expert engaged by Broughton Hall that the salmonella infection was severe and was a significant contributing factor to his death[64] I do not find it necessary to detail the evidence. I rely on the summary provided by Counsel Assisting in written submissions.

Conclusion as to Mr M D cause of death

91. Ultimately, relying upon the microbiological findings on post mortem investigation, the opinion of the very experienced forensic pathologist who examined him and the bevy of experts who examined the records, and the submissions of Counsel for Broughton Hall conceding the effect of the evidence, I find that the weight of the medical evidence establishes that Mr M D death was caused by an overwhelming infection with the salmonella pathogen. This infection, in this medically frail man most likely contributed to him aspirating and thereafter contracting pneumonia leading to his death.

Summary of conclusions:

92. For the reasons given above, I am satisfied on the balance of probabilities that infection with the salmonella pathogen contributed to the causes of death of Mr P N, Mr A T and Mr M D and Mrs T H in a sufficient and material way to conclude that it is therefore appropriate that each of these deaths remain part of this investigation.

[62] TS 242-7; Exhibit 4
[63] Dr Hammond gave the cause of death of Mr M D as fatal cardiac arrhythmia with the immediate precipating cause being left lower lobe pneumonia.
[64] TS 519

Judge J. Coate
State Coroner

February 14, 2011