

Appendices

Appendix A.

Additional information on the study design used in HISAAP

Table A1.1. Location of 18 schools participating in the Hunter component of the HISAAP project

Study area / (code) name of school	Location	Distance from school	
		Industry	Monitor *
<i>Stockton:</i>			
(11) Stockton Public	Clyde St, Stockton	< 2km	< 1km
(12) St Peters [†]	Dunbar St, Stockton		
<i>Wallsend:</i>			
(21) Plattsburg Public school	Ranclaud St, Wallsend	n.a.	< 1km
(22) Wallsend Public	Martindale St, Wallsend	n.a.	< 2km
(23) St Patricks [†]	Wentworth St, Wallsend	n.a.	< 1km
(24) Wallsend South	Smith Rd, Elernmore Vale	3.5km	3.5km
<i>Mayfield:</i>			
(31) Mayfield East	Crebert St, Mayfield	< 1km	< 1km
(32) Mayfield West	Gregson Ave, Mayfield	< 2km	< 2km
(33) St Columbans [†]	Church St, Mayfield	< 1km	< 1km
(34) Mayfield Christian Community School [†]	Kerr St (corner Bull St), Mayfield	< 1km	< 1km
<i>Beresfield:</i>			
(41) Beresfield	Lawson Ave, Beresfield	n.a.	< 1km
(42) Woodberry	Lawson Ave, Woodberry	n.a.	< 1km
(43) Tarro	Eastern Ave, Tarro	n.a.	< 2km
(44) Our lady of Lourdes [†]	Anderson Drive, Tarro	n.a.	< 2km
<i>North Lake Macquarie:</i>			
(51) Argenton	Montgomery St, Argenton	< 1km	< 1km
(52) Boolaroo	Main Rd, Boolaroo	< 1km	< 1km
(53) Speers Point	Main Rd, Speers Point	< 2km	< 1km
(54) Biddabah	Medcalf St, Warners Bay	< 3km	< 2km

*. Distance from school to the air pollution monitor whose data was used in the analysis

†. Private school

n.a. No industry in study area

Table A1.2. Location of industry at each study area

Study area / source	Location of industry
<i>Stockton:</i>	
Incitec	Greenleaf Rd, Kooragang Island
BHP	Industrial Drive, Mayfield
<i>Wallsend:</i>	
n.a.	n.a.
<i>Mayfield:</i>	
BHP	Industrial Drive, Mayfield
<i>Beresfield *:</i>	
Crematorium	Anderson Drive, Beresfield
Steggles	Hawthorne St Beresfield
<i>North Lake Macquarie:</i>	
Pasminco Metals Sulphide	Main Rd, Boolaroo
Incitec	Main Rd, Boolaroo

n.a.. Not applicable as no industrial source nearby

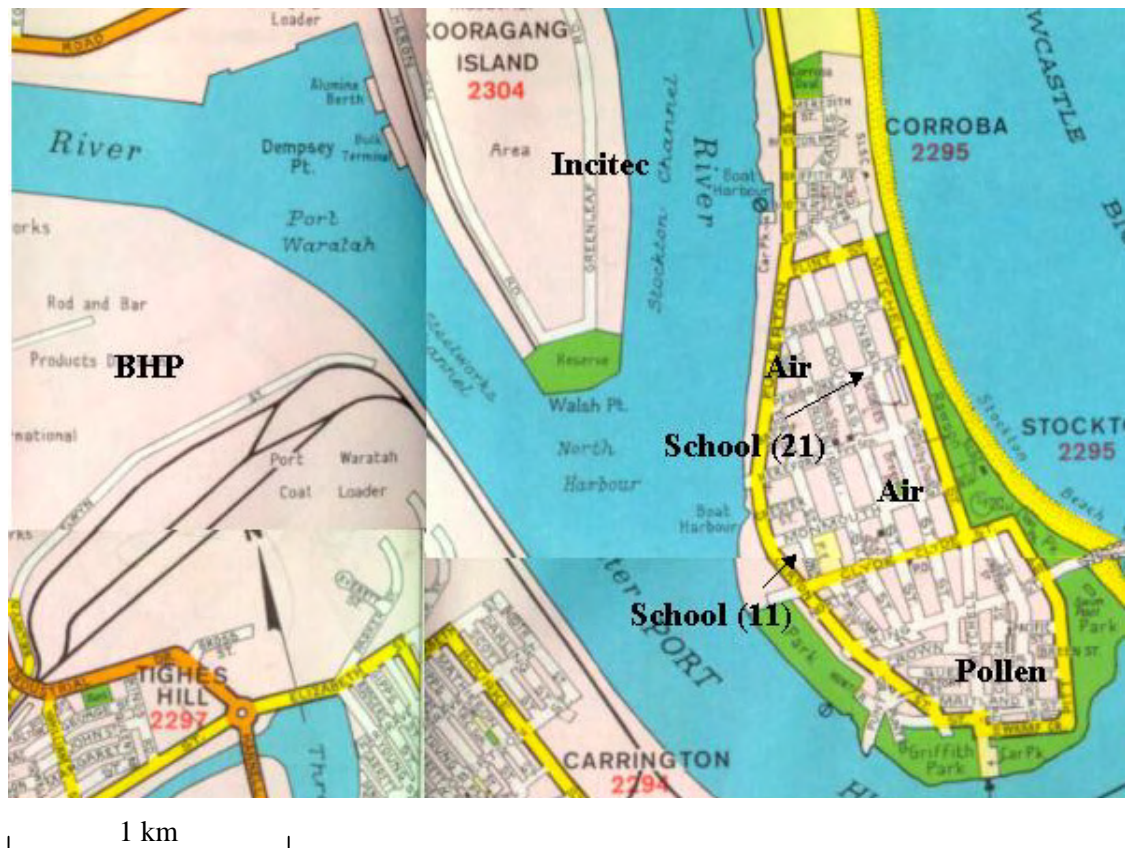
*. Bersfield was a control study area but did have two possible sources of air pollution.

Table A1.3. Location of air quality monitors at each study area

Study area / source	Location of air quality monitor
<i>Stockton:</i>	
Newcastle City Council	Douglas St, Stockton
Newcastle City Council, Incitec	Roxburgh St, Stockton
NSW Health Pollen Study	St. Pauls Anglican Church; cnr Maitland St and Church St, Stockton
<i>Wallsend:</i>	
EPA, Newcastle City Council	Wallsend Baths at Francis St, Wallsend
ANSTO, NSW Health Pollen Study	Pettinger Building at the former Wallsend Hospital; Longworth Ave, Wallsend
<i>Mayfield:</i>	
EPA, NCC, BHP, ANSTO, NSW Health Pollen Study	BHP Recreation Club at Crebert St, Mayfield
Newcastle City Council	Tourle St, Mayfield
Newcastle City Council	Allowah St, Waratah
<i>Beresfield:</i>	
EPA	Francis Greenway High School at Lawson Ave, Woodberry
NSW Health Pollen Study	Crematorium at Anderson Drive, Beresfield
<i>North Lake Macquarie:</i>	
Pasminco Metals Sulphide	Sixth St, Boolaroo on slopes of Munibung Hill
Pasminco Metals Sulphide	Victoria St, Argenton
Pasminco Metals Sulphide	First St, Boolaroo
Pasminco Metals Sulphide	Fourth St, Boolaroo
Pasminco Metals Sulphide	Lake View St, Boolaroo
Lake Macquarie City Council *	Council Chambers at Main Rd, Speers Point
NSW Health Pollen Study	Council Chambers at Main Rd, Speers Point

*. Envirosciences Pty Ltd. were commissioned by Lake Macquarie City Council to collect air quality data

Figure A1.1. Map of Stockton study area showing industry, schools, and air monitoring locations



Adapted from (Gregory's Publishing Company 1989)

Air. Air monitoring station

Pollen. Pollen monitoring station

School IDs are displayed in this figure. Refer to Table A1.1 for the coding scheme applied.

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Figure A1.2. Map of Wallsend study area showing industry, schools, and air monitoring locations



1 km

Adapted from (Gregory's Publishing Company 1989)

Air. Air monitoring station

Pollen. Pollen monitoring station

School IDs are displayed in this figure. Refer to Table A1.1 for the coding scheme applied.

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Figure A1.3. Map of Mayfield study area showing industry, schools, and air monitoring locations



Adapted from (Gregory's Publishing Company 1989)

Air. Air monitoring station

Pollen. Pollen monitoring station

School IDs are displayed in this figure. Refer to Table A1.1 for the coding scheme applied.

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Figure A1.4. Map of Beresfield study area showing industry, schools, and air monitoring locations



1 km

Adapted from (Gregory's Publishing Company 1989)

Air. Air monitoring station

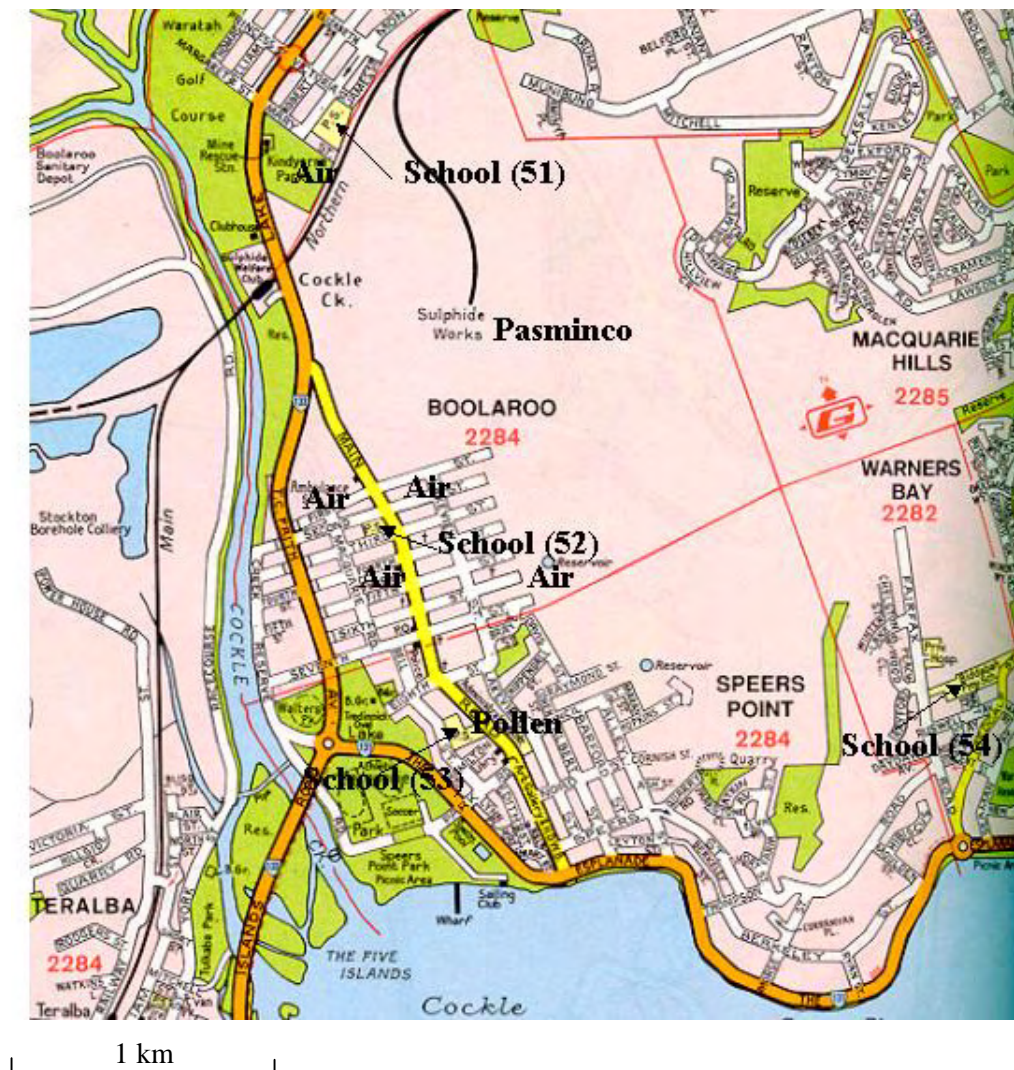
Pollen. Pollen monitoring station

School IDs are displayed in this figure. Refer to Table A1.1 for the coding scheme applied.

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Figure A1.5. Map of North Lake Macquarie study area showing industry, schools, and air monitoring locations



Adapted from (Gregory's Publishing Company 1989)

Air. Air monitoring station

Pollen. Pollen monitoring station

School IDs are displayed in this figure. Refer to Table A1.1 for the coding scheme applied.

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A2. Distance from child's home to school

The location of the five study areas Stockton, Wallsend, Mayfield, Beresfield, and North Lake Macquarie is shown in Figure A2.1

Figure A2.1. Map showing the five study areas and nearby suburbs



10 km

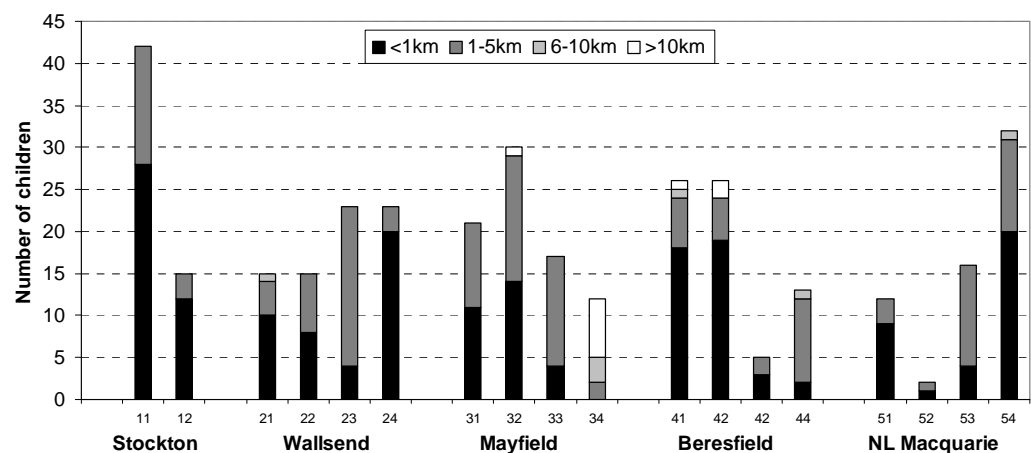
Adapted from Wilkins Tourist Maps 2000

Most children attending school at Stockton lived at Stockton, the remainder lived in the neighbouring suburbs of Fern Bay and Fullerton Cove. Children attending school at Wallsend mainly lived at either Wallsend, Elernmore Vale, Maryland, New Lambton Heights or Rankin Park. One child lived out of the immediate area at Blackhill. Children attending public schools at Mayfield lived at either Mayfield, Mayfield East or Mayfield West. None of the children

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attending Mayfield Christian School (code 34) lived at Mayfield. They travelled from Abermain, Medowie, Merewether, Metford, Raymond Terrace, Sandgate, South Wallsend, Tanilba Bay, Wallsend, Warabrook, West Wallsend or Wickham. Children attending school at Beresfield mainly lived at Beresfield or Woodberry. The remainder lived in the neighbouring suburbs of Ashtonfield, Millers Forest, Taro, Tenambit and Thornton. Children attending school at North Lake Macquarie lived at Argenton, Speers Point, Warners Bay, Lakelands, Boolaroo, and Booragul. Others lived further afield at Belmont, Cardiff, Edgeworth, Glendale, Teralba or Woodrising. Results are presented in Figure A2.2.

Figure A2.2. Distance from child’s home to school, by school attended



School IDs are shown in figure. Refer to Table A1.1. for corresponding names of schools

References

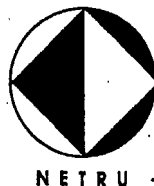
Gregory's Publishing Company. Gregory's street directory, Newcastle. 17th ed. NSW: Universal Press Pty. Ltd.; 1989.

Appendix B.

Questionnaire booklet used in Phase II of HISAAP

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA

Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
A/Prof Michael Hensley
Dr Peter Lewis
Dr John Włodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

Children's Health Study - Phase II

INFORMATION SHEET

Dear Parent/Guardian

Thank you for completing the questionnaire in the first part of the study. From the questionnaire, you reported that your child has had cough or wheeze. You and your child are being invited to take part in Phase II of the study.

Phase II will help us work out what the link is between air pollution and children's health.

What does Phase II involve?

In Phase II, you and your child will be asked to keep a diary for 7 months. We will supply the diary to you. On the diary, you are asked to note down each day whether your child had a cough, wheeze or runny nose.

We will be providing a peak flow meter for your child to use each day. The peak flow meter is like a tube, that you blow into a few times each day. You are asked to write down the peak flow meter score in the diary.

We will be showing you how to use the diary and the peak flow meter before the study starts. At the start, we will be measuring your child's lung function with a device similar to a peak flow meter, that also involves blowing into a tube.

We will be contacting you about every two weeks to see how you are going, and answer any questions you may have. We will usually contact you by phone, but every second time, we would like to see you at the school briefly to make sure everything is OK. This will probably only take a few minutes.

As with the first part of the study:

- the information collected will be confidential.
- not wanting to be part of the study will not affect the relationship that you or your child has with the school or the health workers involved in the study.
- if the research team believes that the information you provide should be followed up, we will discuss this with you. You will be given a letter outlining our findings to take to your doctor, if you wish.

If you have any questions about the project, please contact Dr Peter Lewis, Sr Ruth Toneguzzi or Ms Julie Holt, at the Respiratory Medicine Unit, John Hunter Hospital, phone 21 3470.

If you have any complaint about the way the project is being conducted, you may contact the researchers. If an independent person is preferred, you may contact the University Human Research Ethics Officer, Office for Research, Chancellery, University of Newcastle, phone 21 6333; or the Quality Assurance Officer, Room 315 Nurses Home, Royal Newcastle Hospital, Pacific St, Newcastle, phone 26 6432.

Please keep this sheet for your records

B1. Information sheet

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA

Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Ikawa Study of Airways
and Air Pollution (HISAAP)

Study Team:
A/Prof Michael Hensley
Dr Peter Lewis
Dr John Wodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

13 February 1994

Children's Health Study

Dear Parent

Thank you for completing the questionnaire looking at your child's health and environment. The school's response was wonderful.

The information from the first part of the study will be compared with information from other areas of the Hunter as the study progresses.

The second part of the study aims to find out what the link is between lung symptoms such as cough and wheeze and air pollution.

From the answers you have given us, we understand that your child suffers from lung symptoms (cough or wheeze). We are keen to look at how these symptoms are affected by changes in air pollution and the weather.

We would like you and your child to consider taking part in Phase II of the study.

This will involve keeping a daily "diary" of your child's lung symptoms. The diary also includes a simple measurement of breathing by blowing into a small tube.

We would like to meet with you and your child at your child's school to discuss this more fully. We will be in touch in the next few weeks to arrange a day and time.

Thanks for your help.

Yours sincerely

Dr Peter Lewis
Project Manager

Sr Ruth Toneguzzi
Clinical Nurse Specialist

B2. Introduction letters

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA

Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
A/Prof Michael Hensley
Dr Peter Lewis
Dr John Wlodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

25 February 1994

Children's Health Study

Dear Parent

Recently you would have received a letter thanking you for your part in Phase I of our study and the commencement of Phase II.

We would like you and your child to consider taking part in Phase II of the study.

This will involve keeping a daily "diary" of your child's lung symptoms. The diary also includes a simple measurement of breathing by blowing into a small tube.

We would like to meet with you and your child at your child's school to discuss this more fully.

As we are unable to contact you by phone, we would appreciate it if you and your child attend the following appointment:

DAY: _____
DATE: _____
TIME: _____
LOCATION: _____

If this is not suitable you can contact us on 21 3470 (preferably before midday, Monday to Friday) so that we can arrange a more suitable time for you and your child to attend.

Looking forward to seeing you and your child. Thanks for your help.

Yours sincerely

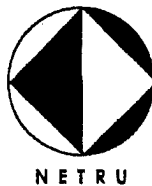
Dr Peter Lewis
Project Manager

Sr Ruth Toneguzzi
Clinical Nurse Specialist

B2. Introduction letters (continued)

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA

Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
Prof Michael Hensley
Dr Peter Lewis
Dr John Włodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

15 March 1994

Children's Health Study

Dear Parent

We would like to meet with you and your child at your child's school to discuss taking part in Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

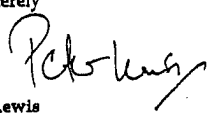
As we are unable to contact you by phone, we would appreciate it if you could phone us so that we can discuss whether you and your child would like to take part in Phase II.

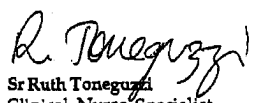
If you are unable to phone us, but would like to meet with us, please indicate below preferred times for us to arrange an appointment with you and your child, and return the bottom portion of this letter in the self addressed envelope enclosed.

If you do not wish your child to take part in Phase II, please indicate below and return the bottom portion of this letter in the self addressed envelope enclosed.

Looking forward to seeing you and your child. Thanks for your help.

Yours sincerely


Dr Peter Lewis
Project Manager


Sr Ruth Toneguzzi
Clinical Nurse Specialist

✂ _____
Please return this section

Child's Name

Child's School

Parent's Name

Parent's Signature

Date

☐ I would like to meet with you to discuss Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

Preferred days and times for appointment:

Day(s): Mon ☐ Tues ☐ Wed ☐ Thurs ☐ Fri ☐ (please tick)

Times: From _____ To _____

☐ I do not wish my child to take part in Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

B2. Introduction letter s (continued)

Newcastle Environmental Toxicology
Research Unit (NETRU)
Royal Club Building - Level 1
Royal Newcastle Hospital
P.O. Box 664J
NEWCASTLE NSW 2300
AUSTRALIA
Telephone (049) 23 6214
Facsimile (049) 23 6654



Hunter/Mawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
Prof Michael Hensley
Dr Peter Lewis
Dr John Wiodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

3 August 1994

Children's Health Study

Dear Parent

Thank you for completing last year's questionnaire looking at your child's health and environment. The school's response was wonderful.

The information from the first part of the study will be presented to your school's P & C or School Council Meetings during August and September 1994.

The second part of the study aims to find out what the link is between lung symptoms such as cough and wheeze and air pollution.

From the answers you have given us, we understand that your child suffers from lung symptoms (cough or wheeze). We are keen to look at how these symptoms are affected by changes in air pollution and the weather.

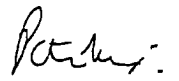
We would like you and your child to consider taking part in Phase II of the study.

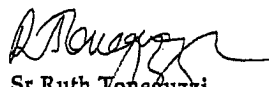
This will involve keeping a daily "diary" of your child's lung symptoms. The diary also includes a simple measurement of breathing by blowing into a small tube.

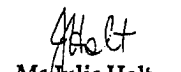
We would like to meet with you and your child at your child's school to discuss this more fully. We will be in touch in the next few weeks to arrange a day and time.

Thanks for your help.

Yours sincerely


Dr Peter Lewis
Project Manager

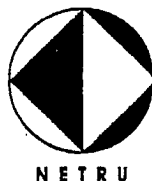

Sr Ruth Toneguzzi
Clinical Nurse Specialist


Ms Julie Holt
Research Nurse

B2. Introduction letters (continued)

Newcastle Environmental Toxicology
Research Unit (NETRU)
Royal Club Building - Level 1
Royal Newcastle Hospital
P.O. Box 664J
NEWCASTLE NSW 2300
AUSTRALIA

Telephone (049) 23 6214
Facsimile (049) 23 6654



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
Prof Michael Hensley
Dr Peter Lewis
Dr John Wodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

22 August 1994

Children's Health Study

Dear Parent

Recently you would have received a letter thanking you for your part in Phase I of our study and the commencement of Phase II.

We would like you and your child to consider taking part in Phase II of the study.

This will involve keeping a daily "diary" of your child's lung symptoms. The diary also includes a simple measurement of breathing by blowing into a small tube.

We would like to meet with you and your child at your child's school to discuss this more fully.

As we are unable to contact you by phone, we would appreciate it if you and your child attend the following appointment:

DAY: _____
DATE: _____
TIME: _____
LOCATION: _____


If this is not suitable you can contact us on 23 6214 (preferably before midday, Monday to Friday) so that we can arrange a more suitable time for you and your child to attend.

Looking forward to seeing you and your child. Thanks for your help.

Yours sincerely

Dr Peter Lewis
Project Manager

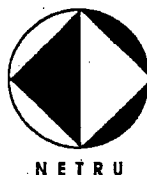
Sr Ruth Toneguzzi
Clinical Nurse Specialist


Julie Holt
Research Nurse

B2. Introduction letter s (continued)

Newcastle Environmental Toxicology
Research Unit (NETRU)
Royal Club Building - Level 1
Royal Newcastle Hospital
P.O. Box 664J
NEWCASTLE NSW 2300
AUSTRALIA

Telephone (049) 23 6214
Facsimile (049) 23 6664



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
Prof Michael Hensley
Dr Peter Lewis
Dr John Wlodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

22 August 1994

Children's Health Study

Dear Parent

We would like to meet with you and your child at your child's school to discuss taking part in Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

As we are unable to contact you by phone, we would appreciate it if you could phone us so that we can discuss whether you and your child would like to take part in Phase II.

If you are unable to phone us, but would like to meet with us, please indicate below preferred times for us to arrange an appointment with you and your child, and return the bottom portion of this letter in the self addressed envelope enclosed.


If you do not wish your child to take part in Phase II, please indicate below and return the bottom portion of this letter in the self addressed envelope enclosed.

Looking forward to seeing you and your child. Thanks for your help.

Yours sincerely

Dr Peter Lewis
Project Manager

Sr Ruth Toneguzzi
Clinical Nurse Specialist


Ms Julie Holt
Research Nurse



Please return this section

Child's Name

Child's School

Parent's Name

Parent's Signature

Date

☐

I would like to meet with you to discuss Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

Preferred days and times for appointment:

Day(s): Mon ☐ Tues ☐ Wed ☐ Thurs ☐ Fri ☐ (please tick)

Times: From _____ To _____

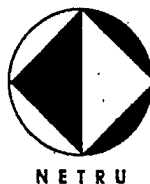
☐

I do not wish my child to take part in Phase II of the Hunter/Illawarra Study of Airways and Air Pollution.

B2. Introduction letters (continued)

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA

Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Illawarra Study of Airways
and Air Pollution (HISAAP)

Study Team:
A/Prof Michael Hensley
Dr Peter Lewis
Dr John Wlodarczyk
Sr Ruth Toneguzzi
Ms Julie Holt

Children's Health Study - Phase II

CONSENT FORM

I have read and understood the Information Sheet on Phase II of the Children's Health Study. I consent to my child taking part.

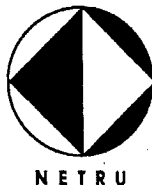
I understand that:

- the information collected will be confidential.
- my child's lung function will be measured at the start of the study using a spirometer (blowing into a tube a few times).
- the researchers will be in contact by telephone about once per month.
- if the research team believes that the information you provide should be followed up, we will discuss this with you. You will be given a letter outlining our findings to take to your doctor, if you wish.
- any questions about the project will be answered by Dr Peter Lewis, Sr Ruth Toneguzzi or Ms Julie Holt, phone 21 3470.
- any complaints about the way the project is being conducted, may be referred to the University Human Research Ethics Officer, Office for Research, Chancellery, University of Newcastle, phone 21 6333; or the Quality Assurance Officer, Room 315 Nurses Home, Royal Newcastle Hospital, Pacific St, Newcastle, phone 26 6432.

Please Print			
Child's Name		Mother/Guardian's Name	
Child's Home Address		Father/Guardian's Name	
Child's Home Suburb	Postcode	Child's Home Phone No.	Contact Phone No. (other than home)
<p>PERMISSION: I give permission for my child to participate in this health study. The data will be used for research purposes only and will be kept confidential.</p>			
PARENT or GUARDIAN'S SIGNATURE		DATE	

B3. Consent form

Newcastle Environmental Toxicology
Research Unit (NETRU)
Respiratory Medicine Unit
John Hunter Hospital
Locked Bag 1
Hunter Region Mail Centre, NSW 2310
AUSTRALIA
Telephone (049) 21 3470
Facsimile (049) 21 3998



Hunter/Illawarra Study of Airway
and Air Pollution (HISAAP)

Study Team
A/Prof Michael Hensle
Dr Peter Lew
Dr John Wlodarczyk
Sr Ruth Toneguzzi
Ms Julie Hc

Children's Health Study

Dear Doctor

Thank you for seeing _____

The research team has referred this patient to you for review as a result of findings during the Children's Health Study.

The study has two parts. The first part consists of a questionnaire about the child's lung health (cough, wheeze, chest colds) and home environment. This questionnaire has gone home with children in years 3, 4 and 5 in several areas in the lower Hunter. The second part of the study involves a smaller group of children with frequent symptoms keeping a diary over a period of time. At the start and end of the diary, the child's lung function is measured by spirometry.

We recorded the following information at the initial meeting before commencing the diary.

Age	_____ yrs	Date	_____ / _____ /94
Height	_____ cms	Sex	M F
Spirometry - FEV ₁	- Observed	_____	l/min
	- Predicted	_____	l/min
	- % predicted	_____	%

The protocol for the study includes referral to the person's usual medical practitioner when lung function is found to be less than 60% of predicted values.

If you have any questions about the study, please call Dr Peter Lewis or Sr Ruth Toneguzzi on 21 3470. Thank you for your help.

Yours sincerely

Peter Lewis
HISAAP Project Manager

Ruth Toneguzzi
HISAAP Clinical Nurse Specialist

B4. Letter to doctor

HISAAP Phase 2 Diary Follow-up

Follow-up No **1**

INITIAL CHECKLIST

Explanation of Phase 2 and Information Sheet given?	Y/N <input type="checkbox"/>	Study No	<input type="text"/>
Consent obtained?	Y/N <input type="checkbox"/>	Patient Initials	<input type="text"/>
Preferred times for follow-up (use 24 hour clock)		School	<input type="text"/>
Phone (1st preference)	M Tu W T F <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Times <input type="text"/> <input type="text"/> to <input type="text"/> <input type="text"/>	Person Interviewed	<input type="text"/>
Personal (1st preference)	M Tu W T F <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Times <input type="text"/> <input type="text"/> to <input type="text"/> <input type="text"/>	(1 = mother 2 = father 3 = carer)	
		Interviewer	<input type="text"/>
		Date	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
		day month year	

HISTORY - REGULAR MEDICATIONS (Respiratory/Hayfever)				
DRUG	DOSE	FREQUENCY (no. of times/day)	DRUG	FREQUENCY (no. of times/day)
Ventolin (mcg)			Avil	
Respolin (mcg)			Benadryl	
Bricanyl (mcg)			Demazin	
Berotec (mcg)			Fabahistin	
Alupent (mcg)			Polaramine	
Medihaler (mcg)			Teldane	
Aldecin (mg)			Zadine	
Becotide (mcg)			Hismanal	
Becloforte (mcg)			Other antihistamine	
Pulmicort (mcg)				
Intal (mg)				
Intal Forte (mg)				
Prednisone (mg)				
Nebulised therapy (mls)			Beconase	
			Rhinocort	
			Rynacrom	

CLINICAL			
Sex <input type="checkbox"/> (1 = male 2 = female)	Age <input type="text"/> yrs		
Height <input type="text"/> cm	Weight <input type="text"/> kg		
Baseline Spirometry		Predicted Spirometry (Nomogram)	
FEV ₁ <input type="text"/> L/min	FEV ₁ <input type="text"/> L/min	Is FEV ₁ < 60% of predicted?	Y/N <input type="checkbox"/>
FVC <input type="text"/> L/min	FVC <input type="text"/> L/min	If YES	Y/N <input type="checkbox"/>
PEFR <input type="text"/> L/min	PEFR <input type="text"/> L/min	letter to GP given?	
Peak flow meter given: Y/N <input type="checkbox"/>		Peak flow technique: Inadequate/Adequate/Optimal <input type="checkbox"/>	
Peak flow instruction given: Y/N <input type="checkbox"/>		Diary instruction given: Y/N <input type="checkbox"/>	

COMMENTS:.....

.....

B5. Initial interview

HISAAP Phase 2 Diary Follow-up:

Follow-up No **2**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="text"/> (1=mother 2=father 3=care)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/ Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews

HISAAP Phase 2 Diary Follow-up:

Follow-up No **3**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother 2 = father 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO

• Is the child's peak flow technique OK? YES NO

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

• Peak Flow Today • Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary? YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK? YES NO

• Have there been any missed symptom recordings? YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

DIARY **1** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **4**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="checkbox"/> (1 = mother 2 = father 3 = carer)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/ Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **5**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother, 2 = father, 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO

• Is the child's peak flow technique OK? YES NO

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

• Peak Flow Today • Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary? YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK? YES NO

• Have there been any missed symptom recordings? YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

DIARY **2** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **6**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/> (1 = mother, 2 = father, 3 = carer)		

Note: All questions relate to the previous 2 weeks OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/ Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **7**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother, 2 = father, 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle)

ALL THE TIME MOST OF THE TIME NO

• Is the child's peak flow technique OK?

YES NO

• Was this recorded correctly on the diary?

YES NO -> If NO, please comment -

• Peak Flow Today • Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary? YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK? YES NO

• Have there been any missed symptom recordings? YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

DIARY **3** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **8**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/> (1 = mother 2 = father 3 = carer)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed / Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **9**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother, 2 = father, 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle)

ALL THE TIME MOST OF THE TIME NO

• Is the child's peak flow technique OK?

YES NO

• Was this recorded correctly on the diary?

YES NO -> If NO, please comment -

• Peak Flow Today

• Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary?

YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact?

YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK?

YES NO

• Have there been any missed symptom recordings?

YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary?

YES NO -> If NO, please comment -

DIARY **4** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **10**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/> (1 = mother, 2 = father, 3 = carer)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/ Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **11**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother, 2 = father, 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever?

YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever?

YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily?

(please circle)

ALL THE TIME

MOST OF THE TIME

NO

• Is the child's peak flow technique OK?

YES NO

• Was this recorded correctly on the diary?

YES NO

-> If NO, please comment -

• Peak Flow Today

• Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary?

YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact?

YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary?

YES NO

-> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK?

YES NO

• Have there been any missed symptom recordings?

YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary?

YES NO

-> If NO, please comment -

DIARY **5** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **12**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/> (1= mother 2= father 3= carer)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **13**

Personal Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	day	month year
Person Interviewed:	<input type="text"/>	Note: All questions relate to the previous 2 weeks OR since last contact with the study team.	
(1 = mother, 2 = father, 3 = carer)			

MISSED SCHOOL

• Has the child missed any school due to respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

DOCTOR/HOSPITAL VISITS

• Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

Was this recorded correctly on the diary? YES NO

If NO, please comment: _____

PEAK FLOW

• Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO

• Is the child's peak flow technique OK? YES NO

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

• Peak Flow Today • Technique: Inadequate Adequate Optimal

RESPIRATORY/HAYFEVER MEDICATIONS

• Have you been able to record the child's medications on the diary? YES NO NO MEDS.

• Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

• Have you been able to record the child's symptoms on the diary OK? YES NO

• Have there been any missed symptom recordings? YES NO

• If YES, was there any particular event at that time that prevented recording? _____

• Was this recorded correctly on the diary? YES NO -> If NO, please comment -

DIARY **6** RETRIEVED? YES NO

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **14**

Telephone Interview

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>		day month year
Person Interviewed:	<input type="text"/> (1 = mother 2 = father 3 = caren)		

Note: All questions relate to the previous 2 weeks
OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO

If YES, supply dates: _____

_____	_____
_____	_____
_____	_____

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO DON'T KNOW

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Started (please circle)	New Dose	Frequency (times/day)	Ongoing (Y/N)	Date Finished

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording? _____

NEXT SCHOOL APPOINTMENT	Date: <input type="text"/>	Time: <input type="text"/> am/pm
	day month year	

B6. Follow-up interviews (continued)

HISAAP Phase 2 Diary Follow-up:

Follow-up No **15**

FINAL CHECKLIST

Study No:	<input type="text"/>	Interviewer:	<input type="text"/>
Patient Initials:	<input type="text"/>	Date:	<input type="text"/>
School:	<input type="text"/>	Day	month year
Person Interviewed:	<input type="text"/> 0 = mother, 1 = father, 2 = parent		

Note: All questions relate to the previous 2 weeks OR since last contact with the study team.

MISSED SCHOOL

- Has the child missed any school due to respiratory illness or hayfever? YES NO
- Was this recorded correctly on the diary? YES NO -> If NO, please comment -

DOCTOR/HOSPITAL VISITS

- Has the child had any visits to the doctor/hospital for respiratory illness or hayfever? YES NO
- Was this recorded correctly on the diary? YES NO -> If NO, please comment -

PEAK FLOW

- Has the child performed peak flow measurements and recorded them on the diary twice daily? (please circle) ALL THE TIME MOST OF THE TIME NO
- Is the child's peak flow technique OK? YES NO
- Was this recorded correctly on the diary? YES NO -> If NO, please comment -

RESPIRATORY/HAYFEVER MEDICATIONS

- Have you been able to record the child's medications on the diary? YES NO NO MEDS.
- Has there been any change to respiratory/hayfever medications since our last contact? YES NO N/A

IF YES -

Drug Name	Date Changed/Stopped (please circle)	New Dose	Frequency	Ongoing (Y/N)	Date finished

- Was this recorded correctly on the diary? YES NO -> If NO, please comment -

SYMPTOMS

- Have you been able to record the child's symptoms on the diary OK? YES NO
- Have there been any missed symptom recordings? YES NO
- If YES, was there any particular event at that time that prevented recording?
- Was this recorded correctly on the diary? YES NO -> If NO, please comment -

CLINICAL	Sex	<input type="text"/> (1 = male, 2 = female)	Age	<input type="text"/> yrs
	Height	<input type="text"/> cm	Weight	<input type="text"/> kg
SPIROMETRY: FEV ₁ <input type="text"/> L/min FVC <input type="text"/> L/min PEFR <input type="text"/> L/min				

Diaries Returned: (Y or N) 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐

B7. Final interview

38. Diary card (each child completed up to 7 diary cards during the study)

STUDY NO:

First name: _____

SYMPTOM SEVERITY

0. Absent, None at all

1. Barely noticeable, hardly aware of any discomfort

2. Very mild discomfort

3. Mild discomfort

4. Moderate amount of discomfort

5. A great deal of discomfort

6. Most severe discomfort ever

1. During the night Cough (0-6) Wheeze (0-6)

Chest Tightness (0-6)

Breathlessness (0-6)

Morning Peak Flow

2. During the day Cough (0-6) Wheeze (0-6)

Chest Tightness (0-6)

Breathlessness (0-6)

3. At any time Eyes (sore/itchy/red) (0-6)

Nose (runny/stuffy) (0-6)

Evening Peak Flow

4. How much pollution do you think was in the air today? (0-3)

AIR POLLUTION

0. none at all

1. a little

2. some

3. a lot

5. Medications Used: _____

(A) Which of the following asthma puffers are you currently taking? Please circle:

Ventolin • Risperlin • Bricanyl • Berotec • Alupent • Medihaler

If you used the medication you have circled, please record the number of puffs you took each day.

(B) If you used the nebulizer, please record the number of times you used it each day.

(C) Please circle any medications, from the following list, that you are taking whilst keeping this diary.

Avil • Benadryl • Demazin • Fabhalisin • Polaramine • Teldene • Zedine • Histanal • Phenergan • Other antihistamines

Becanase • Rhythocort • Rynacrom / Aldecin • Becotide • Becloforte • Pulmicort • Inhal • Inital Forte • Prednisone / Antibiotics

Did you have -

6. Time away from school due to lung symptoms or hayfever? Please indicate (P = Part day; F = Full day; N = No days)

7. Visits for lung symptoms or hayfever? Please indicate (D = Doctor visit; H = Hospital visit; N = No visit)

8. Days when you didn't sleep at home or in home suburb? Please indicate (A = Away from home/home suburb; N = No time away)

COMMENTS

If you have any questions about the study or the diary please phone Dr Peter Lewis, Sister Ruth Toneguzzi or Ms Julie Holt on 21 3470

Appendix C

Questionnaire booklet used in Phase I of HISAAP

Children's Health Study Questionnaire

Office Use Only				
Study No:				

=Where you live

1 Where were you living when your child was born?

Town or Suburb

State

Country

2 Have you lived in your current residence for the last 12 months? (Please tick the appropriate box)

Yes ☐

No ☐

If No →

2a Where did you move from?

If Yes go to 2b ↓

Town or Suburb

State

Country

What have you noticed about your child's lung health since moving to where you live now? (Lung health means coughing, wheezing or shortness of breath)

There has been no change

My child's lung health is better than before

My child's lung health is worse than before

2b How much risk to children from air pollution do you think there is in your suburb?

Please circle a number from 1 to 7, where 1 means no risk at all and 7 means the highest possible risk.

1	2	3	4	5	6	7
No risk at all						Highest risk possible

Coughs and colds

The next few questions ask about when your child coughs or has a cold.

→3 In the last 12 months has your child had a dry cough at night apart from a cough with a cold or chest infection?

Yes ☐

No ☐

If No go to 4

3a How long has it been since your child had a dry cough at night apart from a cough with a cold or chest infection?

Yes ☐

No ☐

If Yes ↓

Within the past week

Within the past month (but not in the past week)

Within the past twelve months (but not in the last month)

3b Has this cough lasted for more than 2 weeks?

Yes ☐

No ☐

Children's Health Study Questionnaire

Office Use Only				
Study No:				

4 In the last 12 months has your child had a dry cough at night with a cold or chest infection? Yes ☐ No ☐
If No go to 5 ↓

4a How long has it been since your child had a dry cough at night with a cold or chest infection?
Within the past week ☐
Within the past month (but not in the past week) ☐
Within the past twelve months (but not in the last month) ☐

4b Has this cough lasted for more than 2 weeks? Yes ☐ No ☐

5 Has your child ever had colds that go to the chest? Yes ☐ No ☐
If No go to 6 ↓

5a In the last 12 months how many chest colds did your child have?
None ☐ 1 chest cold ☐ 2 to 3 chest colds ☐ 4 or more chest colds ☐

5b How long has it been since your child had a cold that went to the chest?
Within the past week ☐
Within the past month (but not in the past week) ☐
Within the past twelve months (but not in the last month) ☐
More than twelve months ago ☐

Wheezing or whistling in the chest

Questions 6 to 11 are about your child having wheezing or whistling in the chest.

6 Has your child ever had wheezing or whistling in the chest at any time in the past? Yes ☐ No ☐ →
If No go to 12

7 How many attacks of wheezing has your child had in the last 12 months?
None ☐
1 attack ☐
2 to 3 attacks ☐
4 to 12 attacks ☐
More than 12 attacks ☐

8 How long has it been since your child had wheezing or whistling in the chest?
Within the past week ☐
Within the past month (but not in the past week) ☐
Within the past twelve months (but not in the last month) ☐
More than twelve months ago ☐

9 In the last 12 months has your child's chest sounded wheezy during or after exercise? Yes ☐ No ☐

10 In the last 12 months how often on average has your child's sleep been disturbed due to wheezing?

- Never woken when wheezing ☐
 Less than one night per week ☐
 One or more nights per week ☐

11 In the last 12 months has wheezing ever been severe enough to limit your child's speech to only one or two words at a time between breaths? Yes ☐ No ☐

Asthma

12 Has your child ever been diagnosed as having asthma by a doctor or at a hospital? Yes ☐ No ☐

13 Do you have a written plan which tells you how to look after your child's asthma? Yes ☐ No ☐

Wheezing and asthma

If your child does not have asthma, or hasn't had wheezing in the last 12 months, then GO TO Question 17.

14 In the last 12 months, has your child missed school because of asthma or wheezing?

- ☐ Not at all ☐ some days ☐ more than a week ☐ more than a month

15 In the last 12 months how many times has your child been admitted to hospital because of wheezing or asthma?

- ☐ None ☐ Once ☐ 2 times ☐ more than 2 times

16 In the last 12 months, not counting these hospital admissions and visits to Emergency Departments, how many times has your child been to the doctor (family doctor, General Practitioner or specialist) for wheezing or asthma?

16a For a wheezy episode

- ☐ None ☐ 1 visit ☐ 2 to 3 visits ☐ 4 to 12 visits ☐ More than 12 visits

16b For regular 'check up' for asthma

- ☐ None ☐ 1 visit ☐ 2 to 3 visits ☐ 4 to 12 visits ☐ More than 12 visits

Medicines for your child

- 17 In the last 12 months has your child taken any of the following medicines (including pills, puffers, rotahalers or nebulisers)? In NO, please tick the 'Not taken' box.

Please indicate whether they are taken for asthma or wheeze, for cough, for other reasons or not taken at all.

	For asthma or wheeze	For cough	For other reasons	Not taken
Berotec, Bricanyl, Respolin, Ventolin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intal, Intal Forte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aldecin, Becloforte, Becotide, Pulmicort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steroid tablets, Prednisone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nuelin, Theodur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Runny nose

Questions 18 and 19 about having a runny nose when your child DOES NOT have a cold or the flu.

- 18 In the last 12 months has your child had sneezing or a runny or blocked nose when she/he DID NOT have a cold or the flu? Yes ☐ No ☐
If No go to 20 ↓
- 18a In the past 12 months has this runny or blocked nose been accompanied by itchy-watery eyes? Yes ☐ No ☐
- 19 When do most of these episodes occur? (Please tick those that apply)
- | | |
|---------------------------------------|---|
| Summer <input type="checkbox"/> | Autumn <input type="checkbox"/> |
| Winter <input type="checkbox"/> | Spring <input type="checkbox"/> |
| All the year <input type="checkbox"/> | No pattern to them <input type="checkbox"/> |

Your child and family's health

Questions 20 to 25 ask about other aspects of your child's health, and the health of other members of the family.

- 20 Has your child ever had hayfever? Yes ☐ No ☐
- 21 Has your child ever had eczema? Yes ☐ No ☐
(Eczema is an itchy rash that comes and goes. It may affect the folds of the elbows, behind the knees, in front of the ankles, under the buttocks or around the neck, ears or eyes.)
- 22 Has the child's natural mother ever had:
- | | Yes | No | Unknown |
|--|--------------------------|--------------------------|--------------------------|
| asthma? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| nasal allergies, hayfever or eczema? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| chest disease apart from asthma?
(this includes chronic bronchitis,
emphysema, chronic lung disease) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Children's Health Study Questionnaire

Office Use Only				
Study No:				

- 23 Has the child's natural father ever had:
- | | Yes | No | Unknown |
|--------------------------------------|--------------------------|--------------------------|--------------------------|
| asthma? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| nasal allergies, hayfever or eczema? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| chest disease apart from asthma? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- 24 Does your child have any natural brothers or sisters?
- | Yes | No | Unknown |
|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- ↓
If No or Unknown go to 26
- 25 Have any of the child's brothers or sisters ever had:
- | | Yes | No | Unknown |
|--------------------------------------|--------------------------|--------------------------|--------------------------|
| asthma? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| nasal allergies, hayfever or eczema? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| chest disease apart from asthma? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Your child's home

The following questions are about other people at home and your child's home environment.

- 26 Counting yourself, how many people 14 YEARS OF AGE OR OLDER live in this child's home?

1 <input type="checkbox"/>	3 <input type="checkbox"/>	5 <input type="checkbox"/>	7 <input type="checkbox"/>
2 <input type="checkbox"/>	4 <input type="checkbox"/>	6 <input type="checkbox"/>	8 <input type="checkbox"/>

- 27 Counting this child, how many people UNDER 14 YEARS OF AGE live in this child's home?

1 <input type="checkbox"/>	3 <input type="checkbox"/>	5 <input type="checkbox"/>	7 <input type="checkbox"/>
2 <input type="checkbox"/>	4 <input type="checkbox"/>	6 <input type="checkbox"/>	8 <input type="checkbox"/>

- 28 How many bedrooms do you have?

No bedrooms <input type="checkbox"/>	2 bedrooms <input type="checkbox"/>	4 bedrooms <input type="checkbox"/>
1 bedroom <input type="checkbox"/>	3 bedrooms <input type="checkbox"/>	5 or more bedrooms <input type="checkbox"/>

- 29 About when was this building originally built? Do not count remodelling, additions or conversions.

1990 or later <input type="checkbox"/>	1950 to 1959 <input type="checkbox"/>
1980 to 1989 <input type="checkbox"/>	1940 to 1949 <input type="checkbox"/>
1970 to 1979 <input type="checkbox"/>	1939 or earlier <input type="checkbox"/>
1960 to 1969 <input type="checkbox"/>	Don't know <input type="checkbox"/>

Children's Health Study Questionnaire

Office Use Only				
Study No:				

30 Which best describes the building in which your child is living?

- Separate house ☐
 Semi-detached house (row or terrace house, townhouse, duplex or villa) ☐
 Flat or apartment ☐
 A mobile home or caravan ☐
 Improvised home (converted garage, shed, tent) ☐

31 Do you have wall to wall carpet or large rugs in:

- your living room? Yes ☐ No ☐
 your child's bedroom? Yes ☐ No ☐

32 Does your home have any air conditioning?

- Yes ☐ No ☐

If No go to 33 ↓

32a Which rooms have air-conditioning? (Please tick all that apply)

- All rooms (central air-conditioning) ☐
 Living or family room ☐
 This child's bedroom ☐
 Other rooms ☐

32b Does the air-conditioner recirculate indoor air or bring in fresh air from outside, or both?

- Recirculates indoor air ☐
 Brings in outside air ☐
 Both ☐
 Don't know ☐

33 How is your home heated? (Please tick all that apply)

- | | | |
|--------------------------------------|--|---|
| Electricity <input type="checkbox"/> | Natural Gas <input type="checkbox"/> | → Does the heater have a flue? Yes <input type="checkbox"/> No <input type="checkbox"/> |
| Kerosene <input type="checkbox"/> | Solar <input type="checkbox"/> | |
| Coal <input type="checkbox"/> | Wood <input type="checkbox"/> (open fire) | |
| Oil <input type="checkbox"/> | Wood <input type="checkbox"/> (slow combustion fire) | |
| None <input type="checkbox"/> | Other <input type="checkbox"/> → Please specify | <input type="text"/> |

Children's Health Study Questionnaire

Office Use Only				
Study No:				

- 34 During the past twelve months, have any of the following been used to heat your home?
(Please tick all that apply)

Open fireplace ☐
 Slow combustion fireplace ☐
 Portable kerosene heater (unvented) ☐
 Fixed gas heater (vented) ☐
 Fixed gas heater (unvented) ☐
 Portable gas heater (unvented) ☐
 Electric heater ☐
 Reverse-cycle air-conditioning ☐

Other ☐ → Please specify

- 35 Do you have a GAS cooking stove, GAS range or gas oven? Yes ☐ No ☐
 If No go to 36 ↓

- 35a If you have a gas cooking stove, gas range or gas oven is there a fan anywhere in the kitchen area? Yes ☐ No ☐

- 35b Does the fan exhaust go to the outside? Yes ☐ No ☐

- 35c How often is this fan used when the stove is in use?
 Most of the time ☐
 Occasionally ☐
 Rarely or never ☐

- 36 Do you have any dogs, cats, other furry animals, or birds? Yes ☐ No ☐

- 37 Do you have any cats who spend time indoors? Yes ☐ No ☐

- 38 Has there ever been water damage to the building or it's contents, for example from broken pipes, leaks or flood?

Yes ☐ No ☐ Don't know ☐

- 38a Has there been water damage to the building in the past twelve months?

Yes ☐ No ☐ Don't know ☐

- 39 Has there ever been any mould or mildew on any surfaces (other than food) inside the home?

Yes ☐ No ☐ Don't know ☐

Children's Health Study Questionnaire

Office Use Only									
Study No:									

39a Has there been any mould or mildew on any surfaces inside the home during the past twelve months?

Yes ☐ No ☐ Don't know ☐
If No or Don't know go to 40

39b Which rooms have been affected by mould or mildew? (Please tick all that apply)

All rooms	<input type="checkbox"/>	
Living or family rooms	<input type="checkbox"/>	
Bathroom	<input type="checkbox"/>	
This child's bedroom	<input type="checkbox"/>	
Other rooms	<input type="checkbox"/>	→ Please specify <input type="text"/>

About you

The next few questions ask for details about you. If there is another adult in the household, there are some other questions about that person.

40 Are you female or male? Female ☐ Male ☐

41 What is your relationship to this child?

Natural parent	<input type="checkbox"/>	Grandparent	<input type="checkbox"/>
Adoptive parent	<input type="checkbox"/>	Legal guardian	<input type="checkbox"/>
Step parent	<input type="checkbox"/>	Other adult	<input type="checkbox"/>

42 Is English your primary language? Yes ☐ No ☐

43 Is there another adult, for example, your spouse or partner living in your household? Yes ☐ No ☐

The following four questions apply to yourself and another adult living in the household if there is one.

44 What is the highest grade or educational level you (and the other primary adult) have completed?

	Yourself	Other Adult
Completed Year 9 or less	<input type="checkbox"/>	<input type="checkbox"/>
Completed Year 10, School Certificate or equivalent	<input type="checkbox"/>	<input type="checkbox"/>
Completed secondary school, Higher School Certificate	<input type="checkbox"/>	<input type="checkbox"/>
Completed Trade certificate or Technical College course	<input type="checkbox"/>	<input type="checkbox"/>
Other College or University course	<input type="checkbox"/>	<input type="checkbox"/>

Children's Health Study Questionnaire

Office Use Only				
Study No:				

45 Do you currently smoke cigarettes?

Yourself Yes ☐ No ☐

Other adult Yes ☐ No ☐

If both No go to 47 ↓

46 About how many cigarettes do you smoke on average per day INSIDE YOUR HOME?

	None	Fewer than 10	10 to 14	15-24	25-34	More than 35
Yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other adult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

47 Do you currently smoke pipes or cigars?

Yourself Yes ☐ No ☐

Other adult Yes ☐ No ☐

48 Not counting yourself and other spouse or partner, does anyone smoke cigarettes within your home (as opposed to smoking only outside your home)?

Yes ☐ No ☐

48a Counting only these other smokers, about how many cigarettes are smoked PER DAY inside your home?

None	Fewer than 10	10 to 14	15-24	25-34	More than 35
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Thankyou for completing the
Children's Health Study Questionnaire*

Appendix D.

Description of air quality and meteorological data collected in phase II of
HISAAP

Introduction

In this Appendix a complete description is provided of all exposure data received. The results are presented by study area: Stockton (Section D.1), Wallsend (Section D.2), Mayfield (Section D.3), Beresfield (Section D.4) and North Lake Macquarie (Section D.5). Refer to Appendix A1 for the map of each area showing the position of the air monitoring stations relative to the schools and any industry. A summary of the main results is provided in Chapter 6.

D.1 Stockton

D.1.1 Particulates

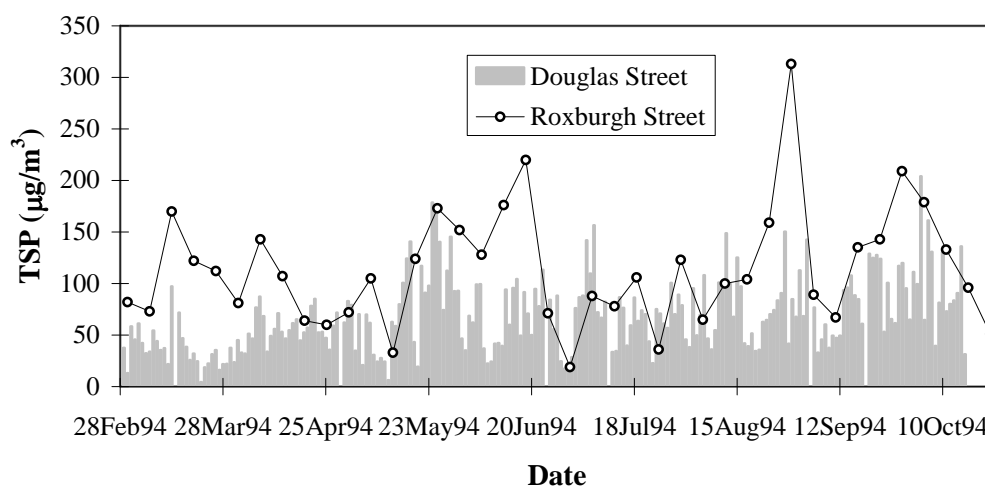
Several measures of particulates were collected (Table D.1). All measurements were made using a high volume sampler (HVS), which is a filter-based method. Data on total suspended particulates (TSP) were collected daily by Newcastle City Council (NCC) at Douglas Street, Stockton; and every six days (6-daily TSP) at Roxburgh Street, Stockton. Incitec, the local industrial plant, as part of its routine air quality monitoring program, also recorded six-daily TSP at Roxburgh Street. For the main analysis, estimates of particulate matter less than 10µm in size (PM10) were reported. These were derived by multiplying the daily TSP data at Douglas Street by 45% (this percentage was based on estimates found for nearby Mayfield). A description and comparison of these data is now given.

Table D.1. Particulate measurements at Stockton during the study period

Source	Measurement (method)	Location
Newcastle City Council	Daily TSP (HVS)	Douglas Street, Stockton
Newcastle City Council	6-daily TSP (HVS)	Roxburgh Street, Stockton
Incitec	6-daily TSP (HVS)	Roxburgh Street, Stockton

The daily TSP levels recorded by NCC at Douglas Street ranged from 4 to 204 µg/m³ (mean 69). The 6-daily TSP levels recorded by NCC at Roxburgh Street ranged from 19 to 313 µg/m³ (mean 114). The 24-hour goal for TSP of 260 µg/m³ was exceeded once at Roxburgh Street, and this occurred on 29/8/94. The 6-daily TSP levels recorded by NCC at Roxburgh Street were much higher than the daily TSP recorded by NCC at Douglas Street (Figure D.1). For the 37 days in common, values at Roxburgh Street were on average 44 µg/m³ higher (range 39 lower to 271 higher) than at Douglas Street. The correlation between the two measures was only 0.37.

Figure D.1. Plot of total suspended particulates at two sites at Stockton during the study period [Daily TSP was recorded by Newcastle City Council at Douglas Street; 6-daily TSP was recorded by Newcastle City Council at Roxburgh St]



The 6-daily TSP recorded by Incitec at Roxburgh Street matched exactly those recorded by NCC at Roxburgh Street on 39 out of 40 occasions. They differed by $100 \mu\text{g}/\text{m}^3$ on 24/6/1994. The 6-daily TSP recorded by NCC at Douglas Street matched exactly with the daily TSP recorded by NCC at Douglas Street on 35 out of 37 occasions. They differed by only $1 \mu\text{g}/\text{m}^3$ on these two occasions.

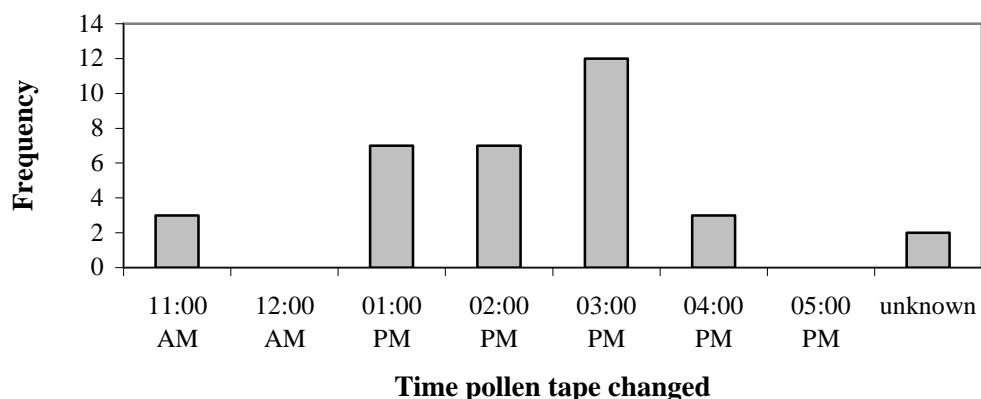
D.1.2 Other pollutants

All measurements of other pollutants were recorded by Incitec at Roxburgh Street. The maximum hourly sulphur dioxide (SO_2) levels ranged from 0.00 to 5.80 ppm (mean 1.80), well below the WHO goal of 12.5 ppm. The mean daily SO_2 levels ranged from 0.00 to 2.90 ppm (mean 0.97). The maximum hourly nitrogen dioxide (NO_2) levels ranged from 0.00 to 5.90 ppm (mean 2.80), well below the goal of 16 ppm. The mean daily NO_2 levels ranged from 0.00 to 3.62 ppm (mean 1.54).

D.1.3 Pollen

The pollen tape was changed on a fortnightly basis during the study period; it was changed a total of 34 times. The time of changing varied between 11am and 5pm (Figure D.2).

Figure D.2. Time pollen tape was changed during the study period at Stockton



D.1.4 Meteorology

No temperature or rainfall data were provided.

D.2 Wallsend

D.2.1 Particulates

Several measures of particulates were collected (Table D.2). Data on PM10 were collected by the Environmental Protection Authority (EPA) using a Tapered Element Oscillating Microbalance (TEOM). They also collected PM2.5 data using nephelometry, and 6-daily PM10 using a high volume sampler to which a size-selective inlet (SSI) was attached. Six-daily TSP was recorded by Newcastle City Council. Australian Nuclear Science and Technology Organisation (ANSTO) provided PM2.5 data using a size-selective inlet. The main analysis used the 24-hourly average PM10 data obtained from the EPA using TEOM. A description and comparison of these data is now given.

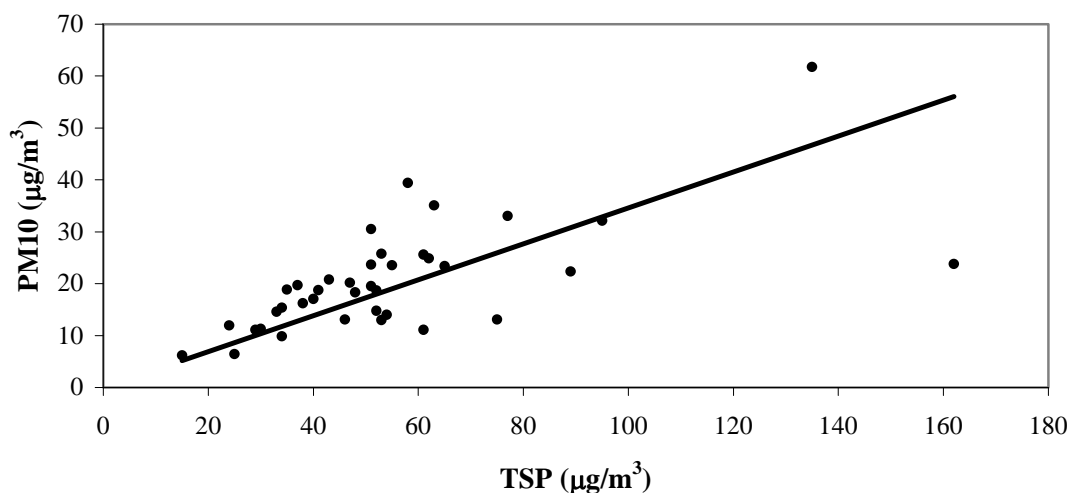
Table D.2. Particulate measurements at Wallsend during the study period

Source	Measurement (method)	Location
Environmental Protection Authority	PM10 (TEOM)	Francis Street, Wallsend
Environmental Protection Authority	PM2.5 (nephelometry)	Francis Street, Wallsend
Environmental Protection Authority	6-daily PM10 (SSI)	Francis Street, Wallsend
Newcastle City Council	6-daily TSP (HVS)	Francis Street, Wallsend
Australian Nuclear Science and Technology Organisation (ANSTO)	PM2.5 (SSI)	Francis Street, Wallsend

The 6-daily TSP recorded by NCC ranged from 15 to 162 $\mu\text{g}/\text{m}^3$ (mean 54), well below the 24-hour goal for TSP of 260 $\mu\text{g}/\text{m}^3$. The daily average PM10 values recorded using TEOM ranged from 3 to 250 $\mu\text{g}/\text{m}^3$ (mean 22). Apart from the outlier of 250 $\mu\text{g}/\text{m}^3$ (which was subsequently removed), all values were less than the 24-hour goal set for PM10. The 6-daily PM10 data recorded by the EPA ranged from 9 to 73 $\mu\text{g}/\text{m}^3$ (mean 22).

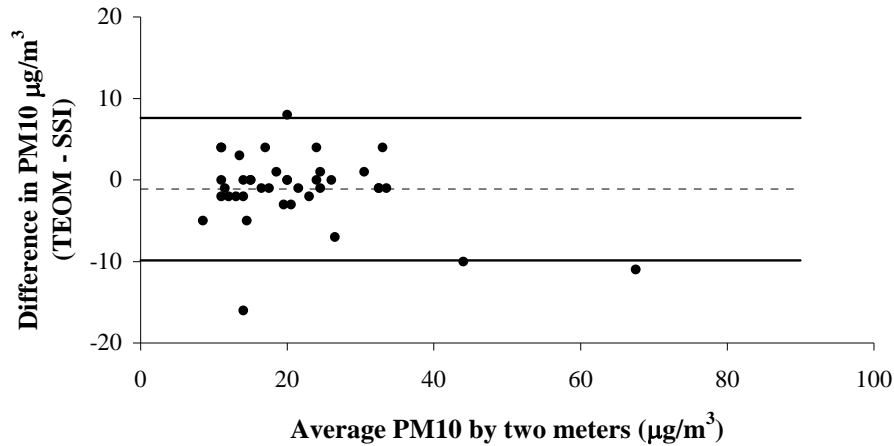
The 6-daily TSP data obtained from NCC were compared with 6-daily PM10 data obtained from EPA. The comparison was based on 38 days and PM10 was estimated to be 36% of TSP (95% CI: 31 to 42) with R^2 equal to 82%. The 6-daily TSP data obtained from NCC were compared with daily average TEOM data obtained from the EPA. The comparison was based on 38 days and PM10 was estimated to be 35% of TSP (95% CI: 30 to 39) with R^2 equal to 86% (Figure D.3).

Figure D.3. Average PM10 (measured using TEOM) versus 6-daily TSP at Wallsend during the study period



The 6-daily PM10 data obtained from EPA using a size-selective inlet (SSI) were compared with average daily PM10 from EPA using TEOM. Both measurements were made on 39 days, with a resulting intra-cluster correlation (ICC) of 0.92. The difference (TEOM-SSI) between the measures ranged from -16 to $8 \mu\text{g}/\text{m}^3$, with mean -1 (Figure D.4).

Figure D.4. Bland-Altman plot of PM10 measured using TEOM and SSI at Wallsend during the study period

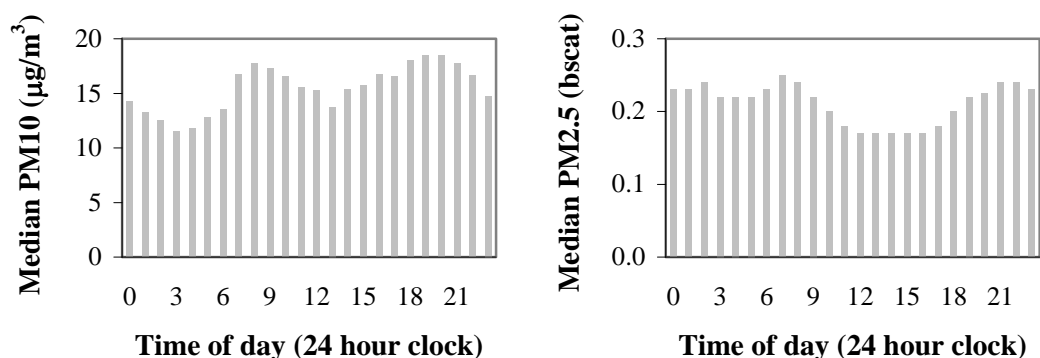


The daily PM2.5 obtained from ANSTO ranged from 2 to 49 $\mu\text{g}/\text{m}^3$ (mean 12). If the flow rate through the unit was not between 20 and 24 L/min the measurement was deemed unreliable. At Wallsend, this occurred on 46% of days (95 out of 206) during the study period. After exclusion of the data on these dates, PM2.5 ranged from 2 to 23 $\mu\text{g}/\text{m}^3$ (mean 9). The average daily PM2.5 recorded by EPA using nephelometry ranged from 0.00 to 1.73 bcat (mean 0.24).

The PM2.5 data obtained from ANSTO were compared with daily-average PM10 obtained from the EPA using TEOM. The comparison was based on 199 days and PM2.5 was estimated to be 25% of PM10 (95% CI: 21 to 30) with R^2 equal to 44%. The corresponding correlation coefficient was 0.28.

The hourly level of PM10 recorded using TEOM varied across the day with peaks at 8am and between 5pm and 8pm. The level of PM2.5 using nephelometry peaked at 8am and 8pm (Figure D.5).

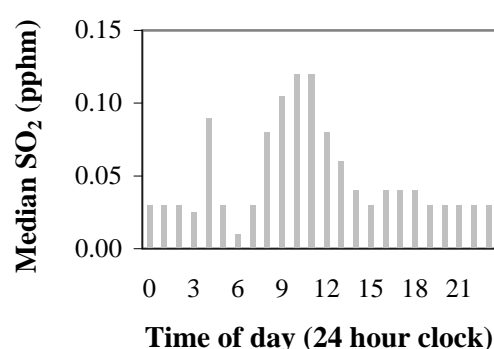
Figure D.5. Level of PM10 (using TEOM) and PM2.5 (using nephelometry), by time of day at Wallsend during 1995



D.2.2 Other pollutants

The maximum hourly SO_2 levels ranged from 0.00 to 7.34 pphm (mean 1.48). The level of SO_2 peaked mid-morning (Figure D.6). The mean hourly SO_2 levels ranged from 0.00 to 1.85 pphm (mean 0.34).

Figure D.6. Level of sulphur dioxide, by time of day at Wallsend during 1995



The levels of other pollutants are shown in Table D.3.

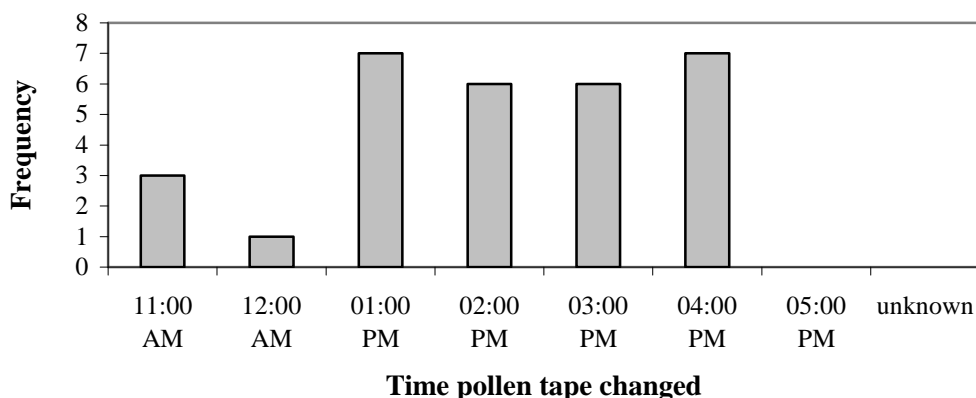
Table D.3. Measurements of other pollutants at Wallsend during the study period

	N	Mean	Minimum - Maximum
Sulphur dioxide (pphm)			
Maximum hourly	227	1.48	0.00-7.34
Mean hourly	227	0.34	0.00-1.85
Nitrogen dioxide (pphm)			
Maximum hourly	232	2.34	0.15-11.20
Mean hourly	232	1.05	0.03-2.99
Ozone (pphm)			
Maximum hourly	245	2.20	0.60-4.86
Mean hourly	245	0.90	0.06-2.33

D.2.3 Pollen

The pollen tape was changed fortnightly during the study period; it was changed a total of 30 times. The time of changing varied between 11am and 5pm (Figure D.7).

Figure D.7. Time pollen tape was changed during the study period at Wallsend



D.2.4 Meteorology

Both the EPA and ANSTO recorded temperature at Wallsend for the duration of the study period. The maximum temperature recorded at ANSTO was on average 9°C higher (range 1°C lower to 23°C higher) than that recorded by the EPA. The minimum daily temperature was only provided by ANSTO. The maximum hourly humidity ranged from 46 to 100 % (mean 96). The mean hourly humidity ranged from 35 to 99 % (mean 80).

D.3 Mayfield

D.3.1 Particulates

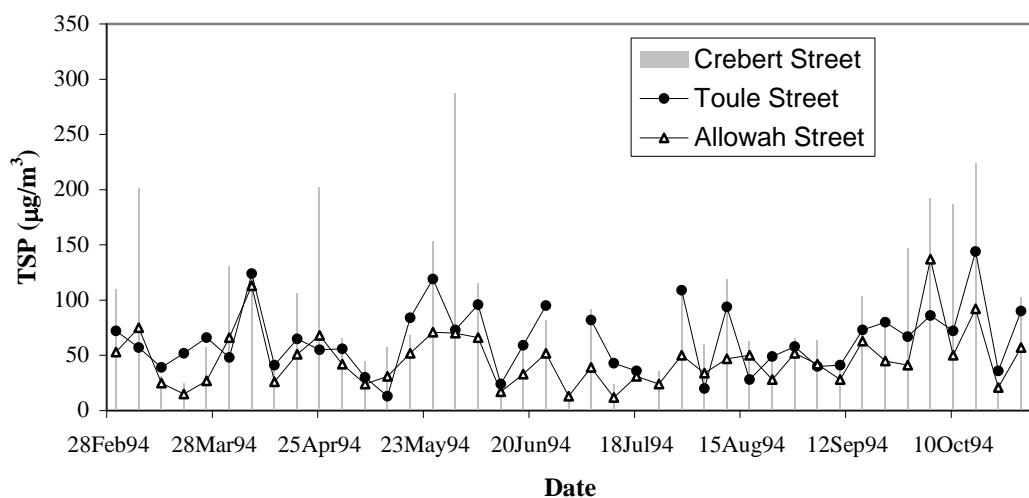
Several measures of particulates were collected (Table D.4). Data on TSP were collected daily by BHP at Crebert Street. The Newcastle City Council collected 6-daily TSP data at Crebert Street, Tourle Street, and Allowah Street. As part of its air quality monitoring program BHP also collected a second daily TSP measurement, daily PM10, and daily PM2.5 data for a period of just over 2 months. ANSTO also provided PM2.5 data using size-selective inlet (SSI). The mobile EPA station collected PM2.5 using nephelometry for 69 days. For the main analysis daily TSP from Crebert Street was multiplied by 45% as an estimate of PM10 (based on results from a sub-analysis of 68 days, see later in this section). A comparison of these data is now given.

Table D.4. Particulate measurements at Mayfield during the study period

Source	Measurement (method)	Location
BHP	Daily TSP (HVS)	Crebert Street, Mayfield
Newcastle City Council	6-daily TSP (HVS)	Crebert Street, Mayfield
Newcastle City Council	6-daily TSP (HVS)	Tourle Street, Mayfield
Newcastle City Council	6-daily TSP (HVS)	Allowah Street, Waratah
BHP quality programme	Daily TSP (HVS)	Crebert Street, Mayfield
BHP quality programme	Daily PM10 (SSI)	Crebert Street, Mayfield
BHP quality programme	Daily PM2.5 (SSI)	Crebert Street, Mayfield
ANSTO	Daily PM2.5 (SSI)	Crebert Street, Mayfield
Environmental Protection Authority	PM2.5 (nephelometry)	Crebert Street, Mayfield

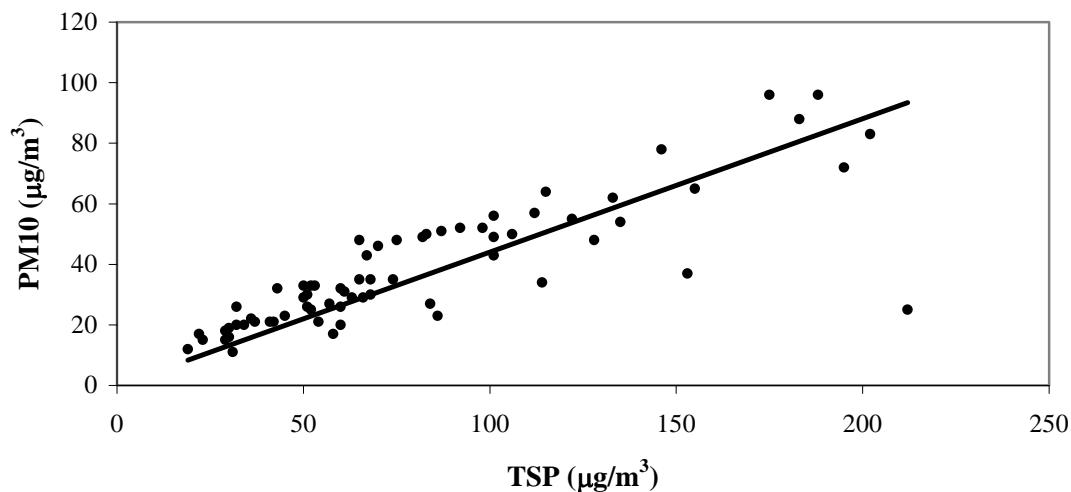
The daily TSP levels recorded by BHP at Crebert Street ranged from 13 to 319 $\mu\text{g}/\text{m}^3$ (mean 84). The 24-hour goal for TSP was 260 $\mu\text{g}/\text{m}^3$, this was exceeded three times at Crebert Street during October 1994.

The 6-daily TSP levels recorded by NCC at Crebert Street were higher than that recorded at Tourle Street and Allowah Street (Figure D.8). There was a high correlation between Crebert Street and Tourle Street values ($r=0.76$) with them being on average 33 $\mu\text{g}/\text{m}^3$ higher (range 27 lower to 214 higher), but poorer between Crebert Street and Allowah Street ($r=0.54$) with them about 47 $\mu\text{g}/\text{m}^3$ higher (range 2 higher to 217 higher).

Figure D.8. Plot of 6 daily total suspended particulates (TSP) at three sites at Mayfield during the study period

The daily TSP at Crebert Street and the quality control data agreed on all 68 occasions. The daily PM10 ranged from 11 to 96 $\mu\text{g}/\text{m}^3$ (mean 38) during the BHP quality control programme. Daily TSP obtained from BHP at Crebert Street was compared with daily PM10 data obtained from BHP at Crebert Street. The comparison was based on 68 days and PM10 was estimated to be 44% of TSP (95% CI: 41 to 47) with R^2 equal to 91% (Figure D.9).

Figure D.9. Daily PM10 (measured using SSI) versus TSP at Mayfield during the study period



The daily PM2.5 from ANSTO ranged from 1 to 39 $\mu\text{g}/\text{m}^3$ (mean 14) across the study period. If the flow rate through the unit was not between 20 and 24 L/min the measurement was potentially unreliable, accounting for 28/209 (13%) of the study days. After exclusion of these dates the revised range was 1 to 36 $\mu\text{g}/\text{m}^3$ (mean 13). There was good agreement between ANSTO and BHP in the measurement of PM2.5, with all disagreements less than 0.5 $\mu\text{g}/\text{m}^3$. The EPA recorded daily mean PM2.5 range 0.02 to 1.09 bscat (mean 0.32) at its mobile unit during the study period.

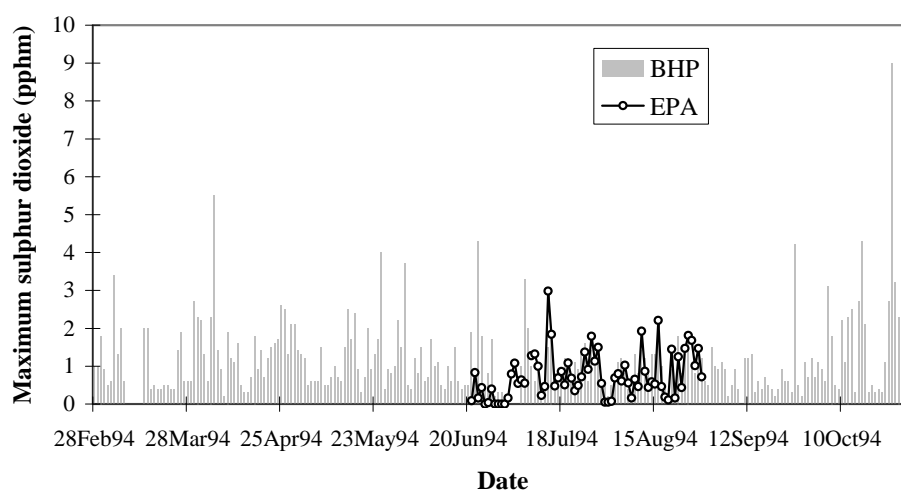
D.3.2 Other pollutants

Sulphur dioxide and nitrogen dioxide levels were recorded by BHP for the duration of the study period. For a period of 69 days they were also measured by the EPA at their mobile unit. A description and comparison of these data is now given.

The maximum daily SO_2 levels recorded by BHP at Crebert Street ranged from 0.00 to 9.00 pphm (mean 1.18). The SO_2 levels recorded at BHP were on average 0.71 pphm higher (range

1.02 lower to 2.83 higher) than that recorded by the EPA (Figure D.10). The correlation of maximum hourly SO₂ between BHP and the EPA was rather poor with correlation coefficient of 0.54. The mean hourly SO₂ ranged from 0.00 to 1.97 (mean 0.37).

Figure D.10. Plot of maximum sulphur dioxide at BHP and EPA mobile at Mayfield during the study period

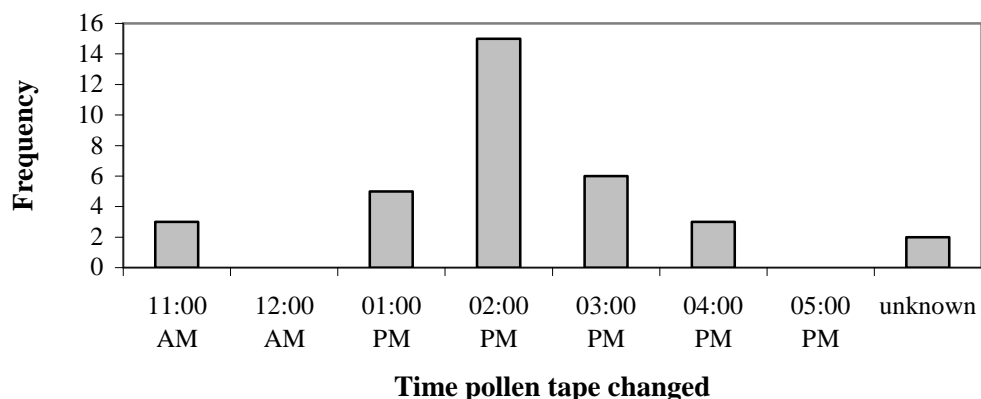


The maximum daily NO₂ levels recorded by BHP at Crebert Street ranged from 0.80 to 5.10 pphm (mean 2.61). The NO₂ levels recorded at BHP were on average 0.71 pphm higher (range 1.02 lower to 2.83 higher) than that recorded by the EPA. The correlation of maximum hourly NO₂ between BHP and the EPA was rather poor with correlation coefficient 0.41. The mean hourly NO₂ levels ranged from 0.18 to 2.77 (mean 1.48).

D.3.3 Pollen

The pollen tape was changed a total of 34 times during the study period. The time of changing varied between 11am and 5pm (Figure D.11).

Figure D.11. Time pollen tape was changed during the study period at Mayfield



D.3.4 Meteorology

The daily mean temperature recorded by BHP at Crebert Street ranged from 11°C (23/7/94) to 24°C (26/10/94). The maximum temperature ranged from 14°C to 36°C. The EPA mobile also measured temperature for 73 days, and ANSTO measured temperature for the duration of the study period. The EPA recorded maximum temperature on average 2 °C lower than BHP (range 0°C to 13°C lower) and 9°C lower than ANSTO (range 5°C lower to 18°C lower). Rainfall was only recorded by BHP. The total rainfall over the study period was 481mm. There were substantial falls (>30mm) on 28 February 1994, 24 March 1994, 13 April 1994, and 3 May 1994.

D.4 Beresfield

D.4.1 Particulates

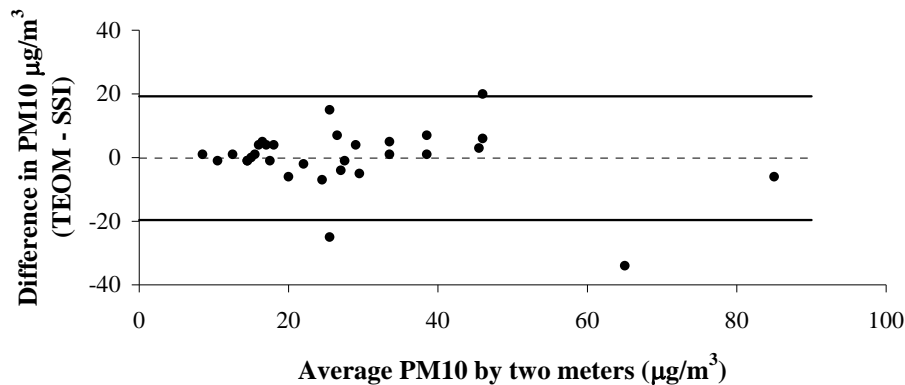
Particulate data were collected by the EPA (Table D.5). This included PM10 using a TEOM and 6-daily PM10 using a size-selective inlet. The TEOM was used in the main analysis. A description and comparison of the two measures is now provided.

Table D.5. Particulate measurements at Beresfield during the study period

Source	Measurement	Location
Environmental Protection Authority	PM10 (TEOM)	Lawson Avenue, Woodberry
Environmental Protection Authority	6-daily PM10 (SSI)	Lawson Avenue, Woodberry

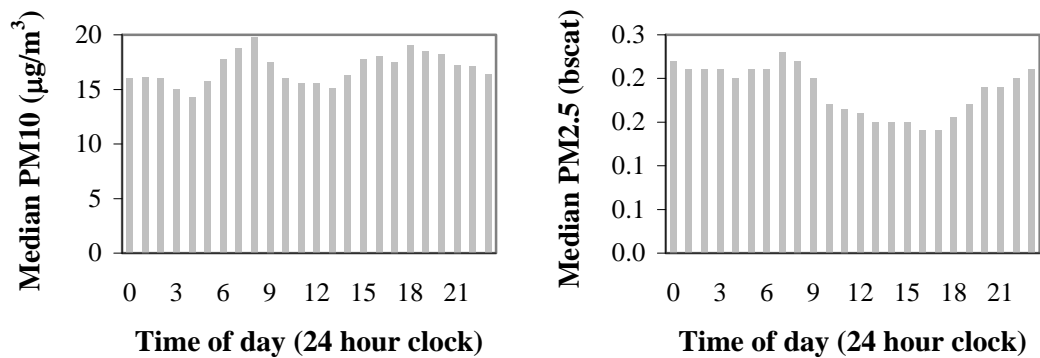
Daily average PM10 measured using a TEOM ranged from 2 to 82 $\mu\text{g}/\text{m}^3$ (mean 25). Six-daily PM10 measured using filters ranged from 8 to 88 $\mu\text{g}/\text{m}^3$ (mean 28). Both measures were available on 31 days. The difference between the measures (TEOM-SSI) ranged from -34 to $+20$ $\mu\text{g}/\text{m}^3$, with mean zero, with a resulting ICC of 0.85 (Figure D.12).

Figure D.12. Bland-Altman plot of PM10 measured using TEOM and SSI at Beresfield during the study period



The level of PM10 (TEOM) showed little variation in levels across the day. The levels of PM2.5 (nephelometry) dropped early to mid-afternoon (Figure D.13).

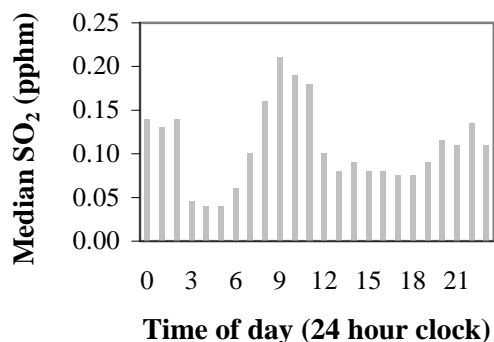
Figure D.13. Level of PM10 (using TEOM) and PM2.5 (using nephelometry), by time of day at Beresfield during 1995



D.4.2 Other pollutants

Sulphur dioxide was only recorded from 5 January 1995 at Beresfield, resulting in only 90 days of observation. The correlation between mean daily SO_2 and maximum daily SO_2 was 0.88. The level of SO_2 appeared to peak mid-morning (Figure D.14).

Figure D.14. Level of sulphur dioxide, by time of day at Beresfield during 1995



The distribution of the other pollutants is provided in Table D.6.

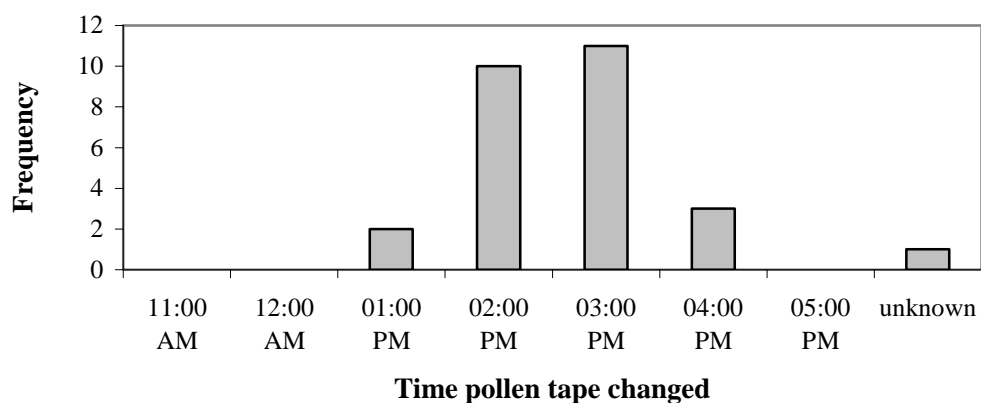
Table D.6. Measurements of other pollutants at Beresfield during the study period

	N	Mean	Minimum - Maximum
Sulphur dioxide (pphm)			
Maximum hourly	90	0.43	0.00-1.80
Mean hourly	90	0.16	0.00-0.87
Nitrogen dioxide (pphm)			
Maximum hourly	183	1.91	0.00-4.10
Mean hourly	183	0.91	0.00-2.27
Ozone (pphm)			
Maximum hourly	217	2.36	2.33-6.53
Mean hourly	217	1.19	0.03-3.50

D.4.3 Pollen

The pollen tape was changed a total of 27 times during the study. It was usually changed early to mid afternoon (Figure D.15).

Figure D.15. Time pollen tape was changed during the study period at Beresfield



D.4.4 Meteorology

The daily mean temperature recorded by the EPA ranged from 11°C to 30°C (mean 19°C) during the study period. Average humidity was highest in December to March 1995. No rainfall data were recorded by the EPA (Table D.7).

Table D.7. Measurements of meteorology at Beresfield during the study period

	N	Mean	Minimum - Maximum
Temperature (°C)			
Maximum hourly	237	25	15-40
Mean hourly	237	19	11-30
Humidity (%)			
Maximum hourly	237	97	56-100
Mean hourly	237	81	35-100

D.5 North Lake Macquarie

D.5.1 Particulates

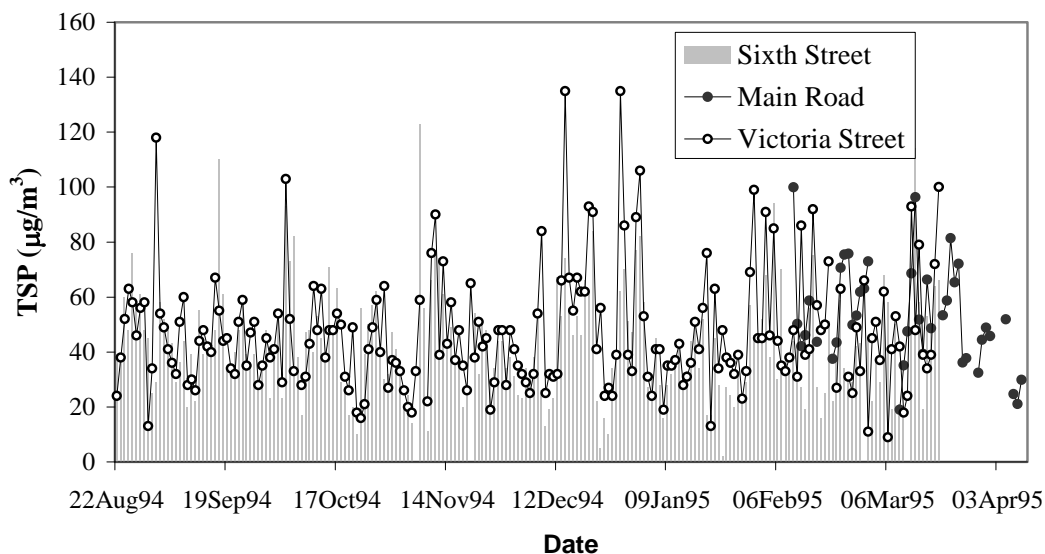
Several measurements of particulates were collected (Table D.8). Sources were Pasminco Metals Sulphide (PMS) and Lake Macquarie City Council (LMCC). Daily and 6-daily TSP measurements were conducted from 22/8/94 to 19/3/95 (stopped 3 weeks early) by PMS at two sites, Sixth Street and Victoria Street. At an additional three sites 6-daily TSP were collected (First St, Lake View St and Fourth Street). Lake Macquarie City Council also recorded daily TSP and daily PM10 at Main Road for an 8-week period from 10/2/95 to 9/4/95. For the main analysis, daily TSP from Sixth Street was multiplied by 60% as an estimate of PM10 (based on results from a sub-analysis of 33 days, see later this section). A description and comparison of the various measures is now given.

Table D.8. Particulate measurements at North Lake Macquarie

Source	Measurement	Location
Pasminco Metals Sulphide	Daily TSP (HVS)	Sixth Street, Boolaroo
Pasminco Metals Sulphide	Daily TSP (HVS)	Victoria Street, Argenton
Pasminco Metals Sulphide	6-Daily TSP (HVS)	Sixth Street, Boolaroo
Pasminco Metals Sulphide	6-daily TSP (HVS)	Victoria Street, Argenton
Pasminco Metals Sulphide	6-Daily TSP (HVS)	First Street, Boolaroo
Pasminco Metals Sulphide	6-daily TSP (HVS)	Lake View Street, Boolaroo
Pasminco Metals Sulphide	6-daily TSP (HVS)	Fourth Street, Boolaroo
Lake Macquarie City Council	Daily TSP (HVS)	Main Road, Speers Point
Lake Macquarie City Council	Daily PM10 (SSI)	Main Road, Speers Point

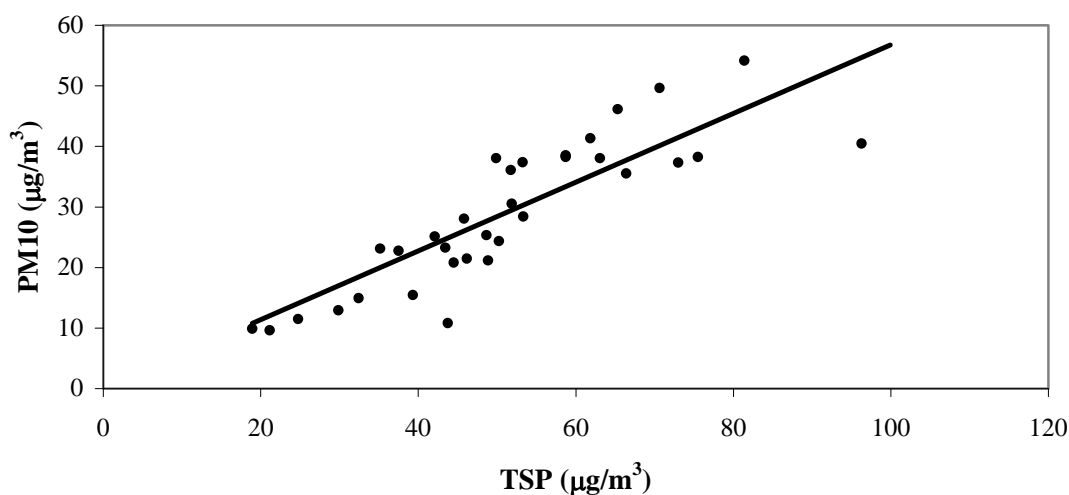
Daily TSP at Sixth Street ranged from 2 $\mu\text{g}/\text{m}^3$ to 123 $\mu\text{g}/\text{m}^3$ (mean 42), well below the guideline of 260 $\mu\text{g}/\text{m}^3$. Daily TSP at Victoria Street ranged from 9 to 135 $\mu\text{g}/\text{m}^3$ (mean 47). Daily TSP at Main Road for the eight weeks ranged from 19 to 100 $\mu\text{g}/\text{m}^3$ (mean 53). Sixth Street measurements were on average 8 $\mu\text{g}/\text{m}^3$ lower (range 97 $\mu\text{g}/\text{m}^3$ lower to 35 $\mu\text{g}/\text{m}^3$ higher) than those at Victoria Street. Sixth Street measurements were on average 16 $\mu\text{g}/\text{m}^3$ lower (range 56 $\mu\text{g}/\text{m}^3$ lower to 18 $\mu\text{g}/\text{m}^3$ higher) than those at Main Road, for the 23 days in common. The levels of daily TSP recorded at Sixth Street tended to be lower than that recorded by PMS at Victoria Street and LMCC at Main Road (Figure D.16). The spearman correlation between Sixth Street and Victoria Street was 0.57, and 0.69 for between Sixth Street and Main Road. The correlation between Victoria Street and Main Road was only 0.15.

Figure D.16. Plot of daily total suspended particulates (TSP) at three sites at North Lake Macquarie during the study period



Daily TSP obtained from LMCC at Main Road were compared with daily PM10 data also obtained from LMCC at Main Road. On seven days (2/3/95 to 8/3/95) the PM10 value recorded was larger than the TSP value. Both values were subsequently set to missing on these dates. The comparison was based on 33 days and PM10 was estimated to be 57% of TSP (95% CI: 53 to 61) with an R^2 equal to 96% (Figure D.17).

Figure D.17. Daily PM10 (measured using SSI) versus TSP at North Lake Macquarie during the study period

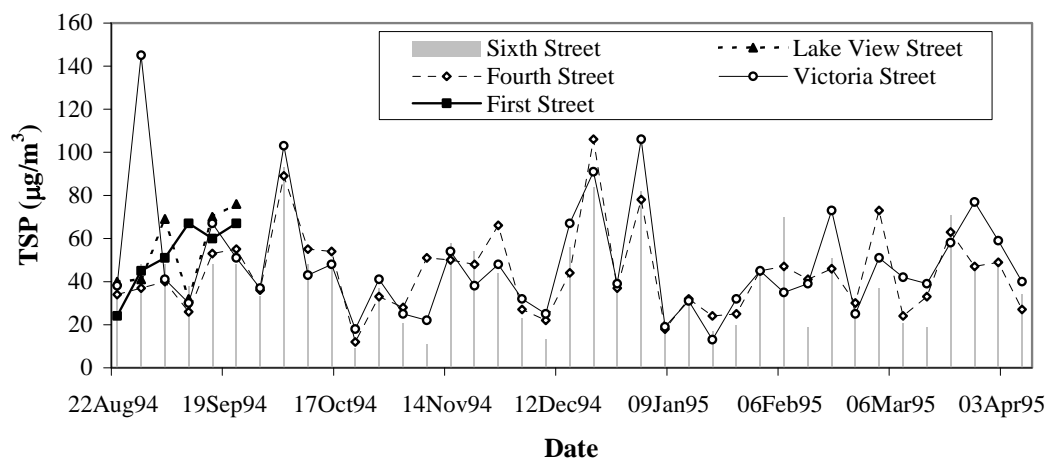


The daily and six-daily TSP measurements at Sixth Street agreed on 31 out of 35 occasions. All disagreements were less than $5 \mu\text{g}/\text{m}^3$ except on 15/11/94 where the discrepancy was $9 \mu\text{g}/\text{m}^3$.

The daily and six-daily TSP measurements at Victoria Street agreed on 30 out of 35 occasions. All disagreements were less than $5 \mu\text{g}/\text{m}^3$ except on 29/8/94 where the discrepancy was $87 \mu\text{g}/\text{m}^3$. The daily and six-daily TSP measurements agreed on all 6 occasions at Main Road.

The 6-daily TSP measurements at Sixth Street correlated well with Victoria Street (0.79) and Fourth Street (0.76) for the 39 days in common (Figure D.18). There were only six 6-daily TSP measures available at First Street and Lake View Street. The respective correlations with Sixth Street were 0.26 and 0.78. The correlation between Victoria Street and Main Road was only – 0.17.

Figure D.18. Plot of 6-daily total suspended particulates (TSP) at five sites at North Lake Macquarie during the study period



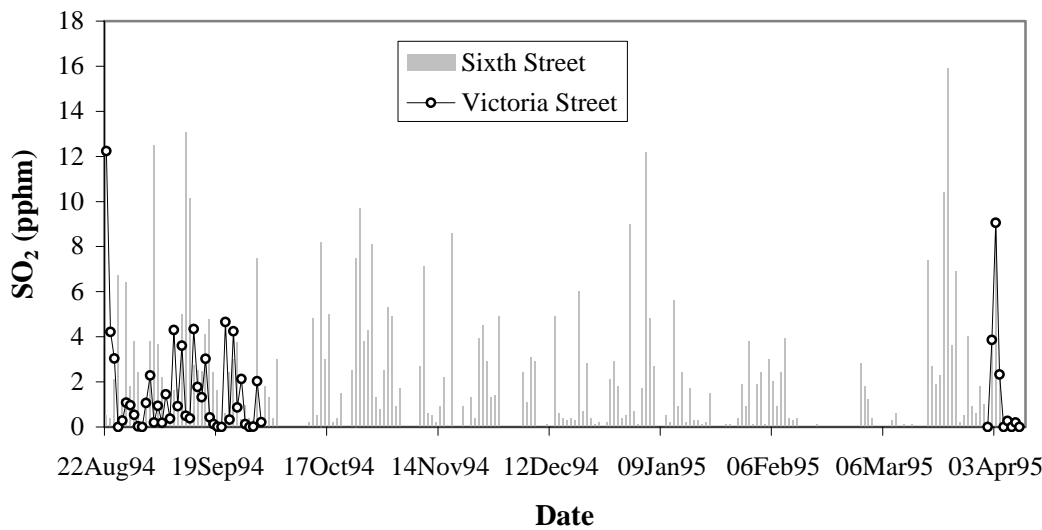
D.5.2 Other pollutants

Sulphur dioxide was monitored at three sites at North Lake Macquarie. Pasminco Metals Sulphide operated all sites. Sulphur dioxide was measured at Victoria Street for 49 days during the study period (22/8/94 to 30/9/94, 1/4/95 to 9/4/95) and at First Street in August 1994. Sixth Street data was used in the main analysis. A description and comparison of the three measures is now given.

At Sixth Street, daily hourly mean concentrations ranged from 0.00 to 1.86 pphm (mean 0.26). Sulphur dioxide levels at Sixth Street were on average 0.16 higher (range 2.18 lower to 1.79 higher) than that at Victoria Street for the 49 days in common. The correlation between Sixth Street and Victoria Street measures was rather poor at 0.43. The correlation between mean and maximum daily SO_2 at Sixth Street was 0.98.

The maximum hourly SO₂ levels at Sixth Street ranged from 0.00 to 15.91 pphm (mean 1.89). They exceeded the WHO goal of 12.5 pphm on 4 occasions. The maximum hourly SO₂ levels at Victoria Street ranged from 0.00 to 12.23 pphm (mean 1.63). Again, the readings were higher at Sixth Street for the 49 days in common (Figure D.19). They were on average 1.15 pphm higher (range 11.73 lower to 12.55 higher). The correlation between the two measures was 0.40.

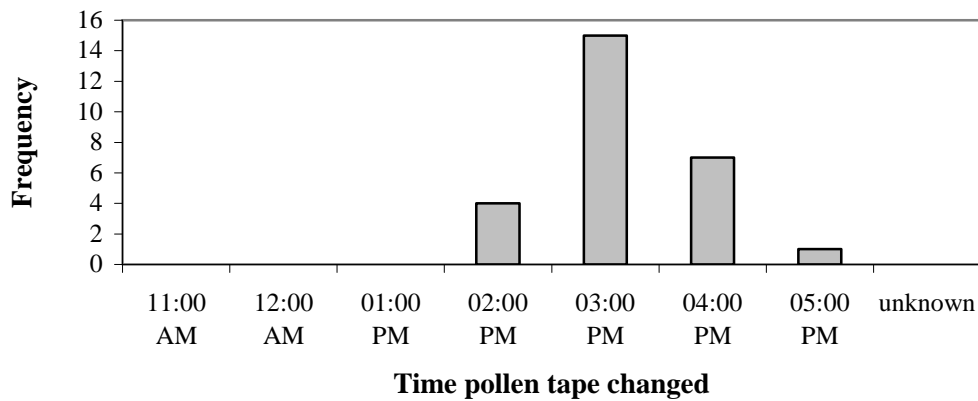
Figure D.19. Plot of maximum hourly sulphur dioxide at two sites at North Lake Macquarie during the study period



D.5.3 Pollen

The pollen tape was changed 27 times during the study period. The time of changing was usually mid to late afternoon (Figure D.20).

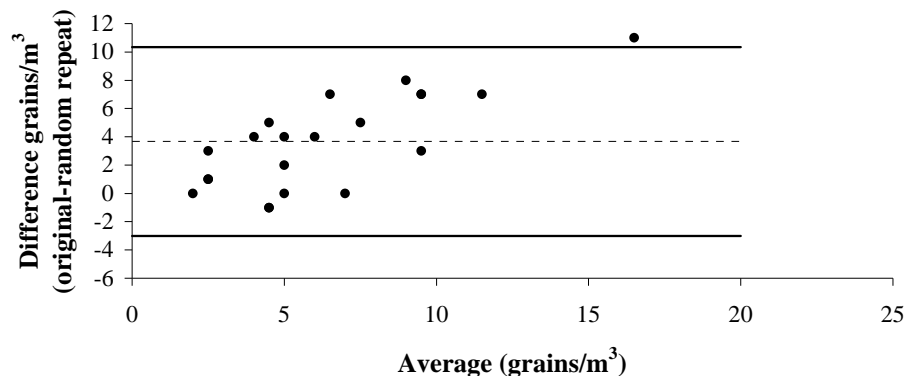
Figure D.20. Time pollen tape was changed during the study period at North Lake Macquarie



Following completion of pollen monitoring at North Lake Macquarie, results were re-examined in an effort to determine the reproducibility of the method used to quantify pollen numbers. Six weeks were selected, from 25 October to 5 December 1994, identified as having a reasonable level of pollen. All 42 slides in this 6-week period were rescanned and the same technician recounted the pollens and fungi as part of the “sequential repeat”. Three alternate weeks were also chosen randomly from within this 6-week period in the “random repeat” and a technician at a collaborating site examined these slides and counted the pollen and fungi.

There was good agreement in the total pollen counts with an intra cluster correlation coefficient (ICC) of 0.96 for the sequential repeat and 0.96 for the random repeat. Agreement was poorer for grass pollen with the original counts much higher, and an ICC of 0.73 at the sequential repeat and 0.45 for the random repeat (Figure D.21). Agreement was good for weed and tree pollen. Agreement was also good for *Alternaria* with an ICC of 0.97 for the sequential repeat and 0.86 for the random repeat.

Figure D.21. Bland-Altman plot of grass pollen measured originally and the three-week random repeat at North Lake Macquarie



Correlations between counts were all greater than 0.70 (Table D.9).

Table D.9. Repeatability of pollen measurements (grains/m³) and fungi measurements (spores/m³) at North Lake Macquarie at 6 weeks (sequential repeat) and 3 weeks (random repeat)

	Description			Correlation		
	N	Mean	Min - Max	Original	Sequential repeat	Random repeat
Total pollen						
Original	42	45.2	1.9-137.1	1.00	0.94	0.92
Sequential repeat	42	45.7	2.9-126.4		1.00	0.91
Random repeat	21	51.3	19.4-113.8			1.00
Grass pollen						
Original	42	5.6	0.0-21.4	1.00	0.78	0.72
Sequential repeat	42	4.1	0.0-12.6		1.00	0.82
Random repeat	21	4.4	1.0-10.7			1.00
Weed pollen						
Original	42	7.5	0.0-43.8	1.00	0.77	0.74
Sequential repeat	42	6.5	0.0-31.1		1.00	0.89
Random repeat	21	5.5	0.0-27.2			1.00
Tree pollen						
Original	42	19.5	0.0-84.6	1.00	0.91	0.78
Sequential repeat	42	18.8	0.0-77.8		1.00	0.92
Random repeat	21	16.3	1.0-54.4			1.00
Miscellaneous pollen						
Original	42	12.5	0.0-40.8	1.00	0.89	0.84
Sequential repeat	42	16.4	0.0-56.4		1.00	0.77
Random repeat	21	25.0	7.8-61.3			1.00
Alternaria						
Original	42	20.5	0.0-162.4	1.00	0.95	0.83
Sequential repeat	42	19.2	0.0-138.1		1.00	0.92
Random repeat	21	20.6	3.9-108.9			1.00

D.5.4 Meteorology

At the PMS Sixth Street monitoring Station, total rainfall over the study period was 772 millimetres. Substantial falls occurred between 1 March and 7 March 1995. Ten minute average gusts peaked at 129km/hr during thunderstorm activity on 2 November 1994. Average daily wind speeds ranged from 4.14km/h (27/2/95) to 27.01km/h (6/11/94). Average daily temperatures ranged from 13.2°C to 30.9°C. Minimum temperature ranged from 7.5°C to 24°C. Maximum temperature ranged from 16°C to 38.5°C during mid-summer. Mean monthly temperatures for December to March, were warmer than average. Daily temperature change ranged from 3°C (various days) to 17.5°C (22/9/94). The lowest recorded mean humidity was 4.7% (14/9/94).

