



**IPCC WGII
Fourth Assessment Report
Climate Change Impacts, Adaptation and Vulnerability
*Government and Expert Review of Second Order Draft***

Specific Comments

EXPERT REVIEW COMMENTS

Chapter 8

August 2006

inc late comments at end

Organization of the review comments file

Comments are organized as follows:

- (a) First are the comments from the Co-Chairs and TSU. These:
 - (i) track the development of the ZOD and FOD, and your responses to review comments on each of these drafts, and then
 - (ii) present comments on the Second-Order Draft
- (b) Second are the comments from the Expert Reviewers, organized in the same format as your FOD comments file.

**Government and Expert Review of Second Order Draft
Confidential, Do Not Cite or Quote
August 2006**

Discussion of expert review comments and record keeping

IT IS RECOMMENDED THAT:

- AUTHORS BEGIN WORK ON THE COMMENTS IMMEDIATELY. SUBSTANTIVE COMMENTS NEED TO BE SEPARATED FROM NON-SUBSTANTIVE, AND THE TWO SHOULD BE TREATED DIFFERENTLY
- CONTACT IS MADE BETWEEN AUTHORS AND THEIR REVIEW EDITORS IN AUGUST

Substantive comments

- The chapter writing team should discuss all substantive expert review comments, by email and/or at Cape Town.
- Substantive comments require full and proper consideration. The *Principles Governing IPCC Work* state that:
 - genuine controversies should be reflected adequately in the text of the Report and
 - it is the role of the Review Editors to advise the lead authors on how to handle contentious/controversial issues
- You must record the outcome of these discussions in this document, under the column 'Notes of the Writing Team'.

Non-substantive comments

- For non-substantive comments, a very brief entry should be made in the column 'Notes of the Writing Team'. The following terms are acceptable:
 - Addressed
 - Not applicable
 - Text removed
 - A tick to denote a comment has been addressed (somewhere on the document this should be stated)

General

- The record should be kept in this document, ideally electronically.
- The document becomes part of the traceable account of the Working Group II Fourth Assessment. When completed to the satisfaction of the Review Editors, a copy should be returned to the TSU by the **8th December 2006**.

Chapter 8

Comments from the Co-Chairs/TSU are laid out as follows: first we comment on whether the SOD addresses the comments we made on the ZOD; second we comment on whether the SOD addresses the comments we made on the FOD; our concluding comments on the Second-Order Draft are at the end.

	Chapter 08 ZOD comments by Co-Chairs and TSU	Has this been addressed in the SOD?	Author responses:
8.Z1	1. Assuming a maximum page length of 45 A4 pages then this draft is already 30% over-length. GENERAL 1. This chapter is fairly concise and well-written. There are some overly long sections which need summaries, tables and / or concluding highlights. Tables with various metrics would be useful (e.g.: millions at risk, areas of disease potential, probabilities of outbreak, etc.).	Yes. Now only 2 pages overlength.	More tables and figures, but still overlengths
8.Z2	2. More regional case studies would be valuable.	OK. Africa, Amazon and Europe Boxes now included	Addressed
8.Z3	3. Section 4 should be the core of the assessment. At present it covers 8 pages. In other chapters it comprises (we think correctly) up to half the chapter. Section 4 should identify thresholds that might be used in Ch 19. Please see point 13 later for more about Section 4.	Section 4 – future impacts and vulnerabilities now covers about 25% of the chapter, so still under represented.	Addressed
8.Z4	4. Generally, more linkage to other chapters would be useful and examples from the USA tend to dominate in places. Some mention of research gaps and data needs would be useful late on.	Still low on linkages to other chapters. Refs now more regionally balanced. Research gaps now described.	Addressed
8.Z5	5. You are not always clear about what mean climate changes you are assuming, and for what timeframes: 2030s, 2050s or 2080s?	Still not always clear	Addressed, now in tables 8.4
8.Z6	6. We suggest that you extend the assessment to include the new information available about effects under: a) various stabilisation scenarios and b) different SRES development pathways. There are publications on these.	Not done. The only mention of stabilisation (apart from ES point 4 and T8.4) is page 27 line 14, but it doesn't say what the stabilisation ppm is.	Not addressed, because to clearly describe vulnerable populations, rather than to go for quantified impacts, where only few studies are existing
8.Z7	7. You need to summarise your conclusions as to how this assessment a) confirms and b) revises the TAR conclusions.	Not done	Addressed
8.Z8	CONTENT 8. Section 8.1 is a good introduction but is based on	Now has sufficient refs.	Addressed

	few references.		
8.Z9	9. Some sub-sections are especially weak, especially in the second half of the chapter (e.g.: on drought – no discussion of targeting the most vulnerable, water scarcity and supply– could be linked to MEA and to MDGs; on mountains; and on costs).	Fixed, but by using 1990 refs (see page 14 lines 27 to 31).	Addressed, under 8.4.2
8.Z10	10. The order is odd (counter-intuitive) in places; e.g. Dengue, then Other, then malaria. Box 4 is based on one reference and hardly makes enough points to warrant a box.	The order is now: dengue, malaria, other Box 4 gone.	Addressed
8.Z11	11. Several areas would benefit from trimming, including Sections 1, 2, and 3; these might be halved and the main focus (and space) given to Section 4, which is on the projected effects.	Done but section 4 still only about 25% of the chapter	Partly Addressed
8.Z12	12. Specifically, much of the current Section 3 seems to refer to projected impacts and might be more appropriate in Section 4. Also, Section 3 needs more concrete information (e.g. in a table) about assumed: population, income, technical levels (e.g. in the various SRES scenarios. Note that variations in these assumptions these hugely affect the projected impacts that follow in Section 4.	Section on assumptions on future trends would benefit from being more systematic in the way it presents info. A table summarising assumptions is still recommended	Not addressed; not available.
8.Z13	13. Section 4 needs to cover the aspects in the outline and might best do this in separate subsections: <ul style="list-style-type: none"> • Physical effects of extreme weather and climate elements • Synergies and interactions • Infectious diseases • Changes in food quality.... • Demographic, economic... • Cumulative effects; multiple stresses. 	This suggestion was not taken up.	Partly addressed, only where possible, as few models are available. We wanted also to focus on vulnerable regions, as this to our assessment is very important.
8.Z14	14. We suggest use of figures and maps to relieve unrelenting text (for example, maps of extended range of some diseases.	This suggestion was partly taken up. 3 figs but no maps. The figures are all flow charts. Suggestions regarding the maps that could be included (taking lead from the text where statements are made indicating maps have been published) are in S8.11	Some more included.
8.Z15	15. We suggest that you add an addendum (see p 31 of the LA1 Green Book with Plenary's requested additions, which include psychological aspects of effects, as well as gender aspects.	Gender is now 'in' Psychological impacts are now included but there's a question mark over whether this is what plenary meant (?). Currently the chapter discusses anxiety/depression (T8.1, p32 and p13 In27-34)	Psychological aspects are addressed where it is an impact, e.g. disasters. Please note that the definition of health, does include psychological well-being! (WHO, 1948)
8.Z16	16. The chapter uses acronyms excessively, some of	Fewer TLAs	Addressed

	them identify national institutions (i.e. GACGC - German Advisory Council on Global Change; VHA - Veteran Health Administration).	What are DALYs? page 27 line 12	
8.Z17	17. Sets of individual paragraphs are common, each summarising one piece of research (for example, the review of research on climate change and malaria; where each piece of research is noted but the threads not pulled together in any way). The review might better read: <i>statement and conclusion (source)</i> ; rather than as often: Source found that xxxx, leading to a conclusion.	This suggestion was partly taken up.	Addressed
8.Z18	18. The air quality text (8.2.3) is comparatively very long.	Now 8.2.6 and shorter	Addressed
	Chapter 08 FOD comments by Co-Chairs and TSU	Has this been addressed in the SOD?	Author responses:
8.F1	MP: Please use the recommended reduced-form subheadings. 1 should be "Introduction", but current content OK	Done	
8.F2	2 should be "current sensitivity/vulnerability", but current content OK Exec Summary's comparison with TAR conclusions is informative Length: is now at its maximum, so any addition would require condensing elsewhere (see below)	Section 8.2 in SOD is "current sensitivity to weather and climate" Done – is now shorter	Addressed
8.F3	p.23 proposed summary table. This would be useful. I suggest more, that is, you follow The example of ch 4 in creating an even more effective summary of findings, thus: a) a table summarising impacts by increments of T change (table 4.5) b) a summary map of projected impacts, worldwide (fig 4.9) c) a burning embers digram for each FFF type to show key vulnerabilities (fig 4.10)	Not done Not done Not done	Addressed
8.F4	Section 4 is still relatively brief (allowing for the tables which are a valuable part of it). Other chapters, I think quite rightly, allocate about half the total \page length to this section. You do not give enough information about: amount of projected impact (and where) under a) different scenarios (eg 1% forcing, AND different SRES futures, AND different stabilisation scenarios) and b) at different times. And could you not illustrate these with some small tables of data and some	Section 4 on future impacts is still too short. No maps.	Addressed

	diagrams/maps? I suggest expanding section 4 by 4 pp and reducing sections 2 and 6 by 4 pages.		
8.F5	5 should be "Costs and other socio-economic aspects". I suggest that food and nutrition come here (transferred from rural in 4), and also demographic aspects. NB the millions at risk by Rosensweig et al post TAR publications for various SRES futures.	Yes, done. Is only 3 paragraphs long and doesn't include food or nutrition (still in previous section). Rosenzweig not referenced.	Not addressed
8.F6	I think 6 could be condensed. This is more discursive than the rest, less source based, and could be more brief.	Still discursive, (<8 refs per page)	Addressed
8.F7	7 should be "Conclusions: Implications for sustainable development". This should contain conclusions (but not a repetition of the ES). There should be here a summary of projected impacts under: 1% forcing at different time scales, under SRES, under stabilisation. NB there is v. little, yet, about impacts avoided by stabilisation; but there is some research on this (using the Hadley 550 and 750 scenarios)	Name now correct. Other suggestions not taken up.	Not Addressed
8.F8	8 should be "Key uncertainties and research priorities"; and should definitely cover the latter. Needs some figures to relieve the unremitting text.	Very small bit on research activities in section 8.8. Section 8.1.4 p7 includes more information regarding research priorities. Suggest this is moved to section 8.8	Not Addressed
8.F9	Below are copies of comments ON THE ZERO-ORDER DRAFT by Martin Parry in Jan 2003, [with comments by MP in square brackets regarding whether FOD has responded to these comments]: General comments: 1) Assuming max page length ZoD draft is 45 pages (equivalent to 30 of printed page in final report), then this draft is already 30% over-length. [now approx at the max length] 2) Sections which could be reduced are sections 1,2, and 3; these might be halved and the main focus (and space) given to section 4 which is on the projected effects. Much in the current section 3 seems to refer to projected impacts and might be more appropriate in Section 4. But section 3 needs more concrete information (eg in a table) about assumed: pop, income, tech levels (eg in the various SRES scenarios) NB variations in these assumptions these hugely affect the projected impacts that follow in Section 4 [now revised in FOD] 3) Section 4 should be the core of the assessment. At present is covers 8 pages. In other chapters it	See above where FOD comments are addressed	Addressed

	<p>comprises (we think correctly) up to half the chapter. [expanded in FOD but still could be substantially expanded, with corresponding condensing of 2 and 6]</p> <p>4) section 4 needs to cover the aspects in the outline, and might best do this in separate subsections: thermal, disease, etc. [FOD does this, now]</p> <p>5) Suggest use of figures and maps to relieve unrelenting text eg maps of extended range of some diseases [FOD still missing these]</p> <p>6). Would not (more) regional case studies be valuable? [FOD has Europe 2003; but would benefit from more illustrative material eg in boxes and figures]</p> <p>7) Tables to summarise conclusions might be useful eg with various metrics: millions at risk, areas of disease potential, probabilities of outbreak etc [Not in FOD]</p> <p>8) Can section 4 identify thresholds that might be used in ch 19? [if FOD included a table of impacts projected for increments of T, as recommended above, this would be v. valuable]</p> <p>9) You are not always clear about what mean climate changes you are assuming, and for what timeframe: 2030s, 2050s or 2080s? [and still not at all clear]</p> <p>10) And could you not extend the assessment to include the new info available about effects under a) various stabilisation scenarios and b) different SRES development pathways. There are publications on these. [FOD still has little on these] [FOD covers this in ES, but not in concluding section 8]</p> <p>12) And an addendum, see p 31 green book with Plenary's requested additions: these include psychological aspects of effects; and gender aspects [gender now in a box; psychological aspect currently only has a sentence or 2; NB if it is not a relevant issue then say so. I suspect the govt who made this recommended addition meant 'perception of risk, etc leading to (eg) migration, etc'), and this is relevant].</p>	<p>Gender is now 'in'</p> <p>Psychological element is in but focussing on depression and anxiety rather than perception of risk</p>	
8.F10	<p>Oswaldo Canziani:</p> <p>Is a well written chapter; however is poorly coordinated with the regional chapters from which should build –up information on regional diseases and endemic. Also cross-reference with some sectoral chapters (3,5,6,7) is necessary better coordination would lead to extension reduction. Although reference is made to the</p>		

	MDG and MEA; for convergence with other chapters and other international actions relative to human health issues, reference should be made to the WSSD Conference (WEHAB) and some of the WMO publications, the UN agency sponsoring the IPCC (i.e. The most recent WCASP publications).		
	Chapter 08 SOD comments by Co-Chairs and TSU		Author responses:
8.S1	LENGTH:	OK. SOD length = 42 (target = 40)	Not Addressed
8.S2	ARE PAO HEADINGS PRESENT?	Yes, apart from 8.2 which is 'current sensitivity to weather and climate' (should be current sensitivity/ vulnerability')	Addressed
8.S3	HAVE MOST GENERAL COMMENTS OF ERs FROM ZOD AND FOD BEEN COVERED?	Some key ones have not been covered	Addressed
8.S4	ARE REFERENCES BROADLY COMPLETE?	yes	Addressed
8.S5	IS THERE LINE-OF-SIGHT TEXT → ES AND TEXT+ES → TS+SPM?	Text → ES: sourcing needs to be checked e.g., statement 15 is sourced as 8.6 but this should be 8.5 SPM: Yes TS: Yes	Addressed
8.S6	Point 1 in the ES does not mention climate! Suggest you move it lower down the list.		Addressed
8.S7	No maps! surely there must be some geographic climate-health material to present graphically.		Addressed
8.S8	Do you have table 8.2 (which is current disease burden) for 2030, 2050 and 2100 under different scenarios. Now that would be both interesting and useful. You may have to construct it from a number of sources but it would be well worth it.		Table deleted
8.S9	Box 8.3 – based on only one reference. Is this about climate variability or climate change?		Addressed
8.S10	ES has no logical order to it would suggest the statements follow → 1, 2, 4, 10, 3, 5, 12, 9, 11, 8, 6, 7, 13-17		Addressed
8.S11	Very short on figures (only 3, all of which are flow charts) in the whole report. Maps in particular would be very useful. How about including a map of dengue vector distribution as mentioned on p21 In 30-37, for example and malnutrition based on relative risk?		Addressed
8.S12	Research priorities section is very small in section 8.8. Section 8.1.4 p7 includes more information regarding research priorities. Suggest this is moved to section 8.8		Addressed
8.S13	Please check sourcing in ES		Addressed
8.S14	Psychological element is covered through anxiety and depression but the Plenary discussion meant perceptions of risk.		
8.S15	TO DO: <ul style="list-style-type: none"> • Please check ES for logical flow and sourcing • Boxes 3 and 5 are not mentioned in the text and box 2 discusses variability and box 1 the 2004 tsunami which isn't climate related • The inclusion of maps (regional/global) would greatly assist the reader. Suggestions are given in 8.S11 • Impacts based on T change and/or time slice would be very useful summarised in a table • Section 8.2.3 should be titled 'Drought' followed by 2 sub-sections 8.2.3.1: Nutrition and food 		Addressed

	security, and 8.2.3.2: Infectious disease	
8.S16	<p>Further comments from Dr Osvaldo Canziani: This SOD presents a number of improvements with respect to the FOD, but still is too long. However, the cancellation of repetitions, through a better inside coordination, and tight cross-referring with the sectoral and regional chapters will help. Although this is one of the chapters recognizing the need for more basic data and information, the corresponding request does not show as neat as it should. The suggestions made in the specific comments might serve to focus better some of the issues which necessarily must impact decision making to become aware of the implications of climate change in the provision of public health services and the use of existing national public defense systems to better disseminate health warnings and alerts.</p> <p>There are some few issues which should be referred to the attention of the users of this chapter regarding, for instance, the recent findings on the fact that the potability ´s treatments, to make freshwater safer, would bring some ill-effects, due to the DBPs- Disinfection By Products, giving rise to a series of diseases. Over 500 DBPs have been identified. The epidemiological studies have found links between long-term consumption of chemically-potable water with high levels of BDPs and the risk of aggressive forms of cancer, such as the blader carcinoma. DBPs have also been linked to spontaneous abortions and birth defects(New Scientist, 3 December 2005, page 45), see also relevant section in this ER ´s comments on Chapter 3</p>	Addressed

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-8-1	A	0				<p>While it is absolutely appropriate to treat evidence with the confidence tag it deserves, the authors could be more explicit about the logic that „no evidence (or weak evidence, for that matter) of association is not evidence of no association”. The reader is left at the end of most chapters with the nagging “so what” question. Shouldn’t the chapters end with a set of policy and research challenges which will then be summarized at the end (chapter 8.6, very well developed, chapter 8.8. underdeveloped, given the dismal state of evidence re health impact of cc).</p> <p>A key point to be made in the opening part of the chapter is that the evidence is so strikingly weak in contrast to the vital interest the general population has in their own and their children’s health and that the scientific community is called upon to work harder to provide that evidence (refer to ESSP human health, ESSP food, the four programs.</p> <p>Linked to this, an explanation for the surprisingly low contribution of classical epidemiology to health impact assessment of CC should be given. The discipline has not lived up to the challenge of multiple exposures, different geographic scales of stresses and impacts, the lack of control groups, enormous lag times between cause and effect, and the treatment of uncertainty (traditional statistics do not help very much (p values, confidence intervals). While some of this is addressed in chapter 8.1.4., there should be an energetic call for method development, i.e. developing new techniques and adapting time-tested ones, and for training young scientists in these methods (e.g. in health impact assessment). This should be made in chapter 8.8. “Key uncertainties and research priorities” Clearly, the academic community has a large role to play and should play it. This should/could be spelt out in chapter 8.8.</p> <p>Very minor: Check spelling: References Sousounis et al. Mommadov et al. Kuhn KD, Campbell Lendrum..et al. (double) Kovats Campbell-Lendrum et al. Koelle : refractory ? Kato et al. Island Gryparis Autoridad et al.... Sobre el cambio climático Ansmann A..source journal or conference? (Rainer Sauerborn, Heidelberg University)</p>	Addressed
E-8-2	A	0				<p>Very short on figures (only 3, all of which are flow charts) in the whole chapter. Maps in particular would be very useful. How about including a map of dengue vector distribution as mentioned on p21 In 30-37, for example and malnutrition based on relative risk? (Paul van der Linden, Met Office)</p>	Addressed
E-8-3	A	0				<p>TO DO:</p> <ul style="list-style-type: none"> • Please check ES for logical flow and sourcing 	Addressed

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						<ul style="list-style-type: none"> • Boxes 3 and 5 are not mentioned in the text and box 2 discusses variability and box 1 the 2004 tsunami which isn't climate related. • The inclusion of maps (regional/global) would greatly assist the reader. • Impacts based on T change and/or time slice would be very useful summarised in a table <p>Section 8.2.3 should be titled 'Drought' followed by 2 sub-sections 8.2.3.1: Nutrition and food security, and 8.2.3.2: Infectious disease (Paul van der Linden, Met Office)</p>	
E-8-4	A	0				<p>This revision is a substantial improvement from the first draft, incorporating more materials published. Table 8.3 is also a new feature, which is useful. (Hisashi Ogawa, World Health Organization Western Pacific Regional Office)</p>	Addressed
E-8-5	A	0				<p>This is a good chapter overall. But I think you should add a comment about the effects of warming in reducing the incidence of cardiovascular morbidity and mortality. I don't believe this reduction would be very large, because of the relatively small warming, but you should note it, to avoid the charge that you are only looking at the negative impacts. (Neville Nicholls, Monash University)</p>	Addressed
E-8-6	A	0				<p>This chapter gives inadequate coverage to the reduction in deaths during the winter from global warming. There is considerable evidence that a warmer climate would reduce deaths. See my article: "Health and Amenity Effects of Global Warming" Economic Inquiry 36(3) (July 1998):471-488. Malaria, Dengue fever, other vector-borne diseases, and most water borne diseases are primarily diseases of poverty. Little mention is made of this. Any policies that reduced incomes would contribute to increase deaths. This should be reflected in the text. (Thomas Gale Moore, Stanford University)</p>	Addressed
E-8-7	A	0				<p>The text has been completed and substantially improved. Also the content table has been adapted. Most of my previous remarks have been taken into account. The executive summary is more concise. However I regret that the factor "population growth" has been left out in 3 (ancient 2) : because of a political concern? The relationship between Health and Environment is very complex and multicausal; a fortiori this is true for health and Climate. Moreover on various topics there is a lack of studies and consequently of research results. Malaria has received much attention but Chagas disease is not mentioned. It should be clearly stated that man-made activities are the primary cause of air pollution, forest fires, hunger etc. In these cases climate change appears as a secondary aggravating factor.</p>	Addressed

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Yola Verhasselt, Royal Academy of Overseas Services)	
E-8-8	A	0				<p>Several of my notes relating to the Executive Summary relate to the selection of which issues to note in the Summary and which not. I would suggest that in final editing there be some 'logical think through' of what is raised and what is not as I am not confident that the selection reflects the scale and quality of evidence as presented in the body of the chapter. When I read it for the first time the issues that struck me were:</p> <ul style="list-style-type: none"> * Exec summ 3 why no reference to rural areas? - it appears odd as impacts on communities producing food for local consumption from both flood and drought would presumably be a significant issue (raised on p33 and the importance of rural malnutrition on p 34 and it is stated that it " may be one of the most important consequences of climate change" on p 34 also). * Exec summ general, health effects arising from drought-induced reduced food security ignored, including malnutrition, although malnutrition is referred to in the main text including in the context of drought p 14 - 15. * Exec summ 12 presumably means to refer to 'water related' not 'water borne' disease (one of the diseases known to respond to flooding - leptospirosis - is clearly water related but not water borne). Same comment specifically in relation to leptospirosis as an omission refers to p12 line 40 et seq; although it is referred to on p22 * Exec summ general - The absence of reference to drowning in relation to flooding appears odd and is a recognised issue in some flood prone countries * In the Exec summ and elsewhere the lack of reference to drought and associated direct and indirect health effects is conspicuous. There appears to be a preference to refer to 'heat waves' but reference to lack of water is infrequent. <p>On concluding reading of the text I was struck that I would have anticipated a brief discussion on diseases/health outcomes that were credibly associated with climate change. This could be quite a long list and I would suggest a very simple format if it were included (eg a simple table). Examples include leptospirosis (flooding associated); legionellosis (increased temperatures directly favour growth and also more complex plumbing systems which are a driving force); Buruli ulcer, health effects associated with freshwater algal blooms</p> <p>Also on concluding the review it seemed to me that the level of reference to water access and safety in the exec summ was low compared to the attention it received in the main text and conclusions</p> <p>(Jamie Bartram, Water, Sanitation and Health Programme)</p>	Addressed

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-8-9	A	0				Psychological element is covered through anxiety and depression but the Plenary discussion meant perceptions of risk. (Paul van der Linden, Met Office)	
E-8-10	A	0				No maps or pictures! surely there must be some geographic climate-health material to present graphically. (Paul van der Linden, Met Office)	Addressed
E-8-11	A	0				General Comments: I reviewed only chapter 8 (Human Health). I found the chapter extremely informative, but sometimes to glib. I was very unclear on what basis uncertainty (confidence level) judgments were being made. This may be discussed in some other (introductory) chapter, but the basis for these judgments needs to be in this chapter as well. As an expert on valuation, it will come as no surprise that I would like to see more space devoted to this topic. (Alan Krupnick, Resources for the Future)	Addressed
E-8-12	A	0				General comments - The authors have done a good job of distilling the results of over 400 studies into a readable, concise summary of current knowledge. The changes made since the last review have improved the structure and readability of the document. My comments are listed below. (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-13	A	0				Comment: The second-order draft of ch.8 fulfills aims of accurate, clearly-presented, well-balanced, short, focused assessment of current knowledge. Well-organized; does good job of including summaries of global research efforts since 3rd Assessment Report; covers a vast body of literature in 42 pp. of text (concise); lots of cross-references; emphasizes clearly the continuing "important gaps in information" (Kim Knowlton, Columbia University)	Addressed
E-8-14	A	1	35			The term "temperature-related mortality" is misleading. Nobody dies from temperature but from e.g. heat load. Most epidemiological studies use just air temperature as an indicator for the thermal environment thus ignoring fundamental physiological knowledge in heat exchange where air temperature, water vapour pressure, wind velocity, and short- and long-wave radiation fluxes are the atmospheric input variables. In heat load conditions heat loss from the human body is mainly by latent heat flux determined by water vapour pressure and wind velocity. Suggestion: "heat-related" or "cold-related" or "thermal stress related" mortality, respectively. (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-15	A	3	1	42		Following are citations for references in the foregoing, which were not provided	Partly addressed

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Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						<p>within the comment. Most of these are available at http://members.cox.net/igoklany/:</p> <p>Arnell, N.W., Cannell, M.G.R. Hulme, M., Kovats, R.S., Mitchell, J.F.B., Nicholls, R.J., Parry, M.L., Livermore, M.T.J., White, A., 2002. The consequences of CO2 stabilization for the impacts of climate change. <i>Climatic Change</i> 53, 413-446.</p> <p>Goklany, IM. 1995. Strategies to Enhance Adaptability: Technological Change, Economic Growth and Free Trade. <i>Climatic Change</i> 30: 427-449.</p> <p>Goklany, IM. 1998. Saving Habitat and Conserving Biodiversity on a Crowded Planet. <i>BioScience</i> 48 (1998): 941-953</p> <p>Goklany, IM. 2000a. Potential Consequences of Increasing Atmospheric CO2 Concentration Compared to Other Environmental Problems. <i>Technology</i> 7S: 189-213.</p> <p>Goklany, IM. 2000b. Applying the Precautionary Principle to Global Warming. Center for the Study of American Business, Washington University, St. Louis, Mo., USA. Policy Study 158. November 2000.</p> <p>Goklany, IM. 2001. Economic Growth and the State of Humanity. Political Economy Research Center, Policy Study 21. March 2001.</p> <p>Goklany, IM, and Straja, SR. 2000. U.S. Death Rates due to Extreme Heat and Cold Ascribed to Weather, 1979-1997. <i>Technology</i> 7S (2000): 165-173.</p> <p>Goklany, IM. 2002. The Globalization of Human Well-being. Policy Analysis, No. 447 (Washington, DC: Cato Institute, August 22, 2002).</p> <p>Goklany, IM. 2003. Relative Contributions of Global Warming to Various Climate Sensitive Risks, and Their Implications for Adaptation and Mitigation. <i>Energy & Environment</i> 14: 797-822.</p> <p>Goklany, IM. 2004. "Climate Change and Malaria." Letter. <i>Science</i> 306: 55-57.</p> <p>Goklany, IM. 2005a. A Climate Policy for the Short and Medium Term: Stabilization or Adaptation? <i>Energy & Environment</i> 16: 667-680.</p> <p>Goklany, IM. 2005b. Is Climate Change the 21st Century's Most Urgent Environmental Problem? Lindenwood Economic Policy Lecture, Series 7, Lindenwood University, St. Charles, MO, also forthcoming in <i>Society</i> (Transaction Publications)]</p> <p>Goklany, IM. 2005c. Is a Richer-but-warmer World Better than Poorer-but-cooler Worlds? 25th Annual North American Conference of the US Association for Energy Economics/International Association of Energy Economics, September 21-23, 2005.</p> <p>Goklany, IM. 2006a. Integrated Strategies to Reduce Vulnerability and Advance Adaptation, Mitigation, and Sustainable Development. <i>Mitigation and Adaptation</i></p>	

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						Response Strategies for Global Change, forthcoming. Goklany, IM. 2006b. Death and Death Rates Due to Extreme Weather Events: Global and U.S. Trends, 1900-2004, Climate Change and Disaster Losses Workshop, 25-26 May 2006, Hohenkammer, Germany. (Indur Goklany, US Department of the Interior)	
E-8-16	A	3	3			Point 1 in the ES does not mention climate! Suggest you move it lower down the list. ES has no logical order to it would suggest the statements follow à 2, 4, 10, 3, 5, 12, 9, 11, 8, 6, 7, 13-17, 1 (Paul van der Linden, Met Office)	Addressed
E-8-17	A	3	6	3	6	delete "HIV/AIDS", because this disease is not involved in climate change related diseases. The transmission is involved in heterosexual behavior, blood collection and drug addict as well as mother to child. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Addressed, by rewriting the piece
E-8-18	A	3	7	3	7	Health is also relevant to other MDGs because improved health reduces poverty and promotes sustainable development (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-19	A	3	7	3	7	Comment: Nice to have a link to Millenium Development Goals mentioned at the beginning of ch.8; emphasizes importance of MDGs (Kim Knowlton, Columbia University)	
E-8-20	A	3	8	3	9	Even if the MDGs were attained, climate change would still have adverse impacts on health (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-21	A	3	9			instead of "high ambient temperature and..." "heat load and..." (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-22	A	3	10			instead of "high ambient temperature on..." "heat waves on .." (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-23	A	3	11	3	14	Comment: Important points to make in beginning of chapter, linking climate to health. Question: could estimates be included of the percentage contibution of climate-sensitive health outcomes to global burden of disease? (Kim Knowlton, Columbia University)	Addressed
E-8-24	A	3	11			"Health outcomes" - should this be "negative" health outcomes? (Peter Berry, Health Canada)	Addressed
E-8-25	A	3	14			Add a new sentence at the end of this para that would read as follows: "Currently, however, at most only a very small fraction of these might be due to climate change, as opposed to climate or climate variability." (Indur Goklany, US Department of the Interior)	Addressed

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E-8-26	A	3	16	3	19	Not sure you can argue these populations are the most vulnerable to health impacts of climate change as there was no systematic analysis of interaction between sensitivity, exposure and capacity to adapt. To suggest settlements in coastal areas are among MOST vulnerable, you would need to show that such settlements generally have less capacity to adapt than do others or that the hazards are expected to be so great as to overwhelm any capacity that exists. This comparison did not occur in the chapter. (Peter Berry, Health Canada)	Addressed
E-8-27	A	3	16	3	19	Expert Review: On the Executive summary; Fourth Assessment Report of Chapter 8 is properly reviewed, still the following description would insert the text. 1) Since the high population growth and economical development should enhance anthropogenic fuel burning and global warming, it will be necessary to reduce over crowding population in various communities of industrialized countries, developing countries and countries with economies in transition for risk reduction strategy. (Mitsuru Ando, Toyama University of International Studies)	Addressed
E-8-28	A	3	16			Included people living in high remote mountainous regions in the most vulnerable populations (von Hildebrand, WHO)	Not addressed
E-8-29	A	3	18	3	18	What does 'resource-dependent' mean in this context. Persumable it means directly dependent on the exploitation of natural resouces (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-30	A	3	18	3	19	Include highlands as some of the vulnerable areas (Andrew Githeko, Kenya Medical Research Institute)	Not Addressed
E-8-31	A	3	18			..low-lying areas, AND PEOPLE WHOSE LIVELIHOOD DEPENDS MAINLY ON AVAILABILITY OF NATURAL RESOURCES (von Hildebrand, WHO)	Not Addressed
E-8-32	A	3	21	3	22	Rewrite the first sentence to read as follows: "A standardized approach to estimating the global burden of disease indicates that in 2000 climate change contributed no more than 0.3% of the global burden of mortality; however, very little confidence can be placed in this estimate." Rationale: (1) McMichael et al. (2004) estimate climate change caused mortality at 166,000 in 2000. However, that year, the total global mortality burden was 55,694,000 according to World Health Report 2001. (2) To reiterate our comments on the FOD, just because the approach is "standardized" does not mean it inspires confidence. My understanding is that these sentences are ultimately based on McMichael et al (2004). But in Chapter 20 of "Comparative Quantification of Health Risks", MacMichael et al. note on page 1547 that "Empirical observation of the health consequences of long-term climate	Addressed in 8.4

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						change, followed by formulation, testing and then modification of hypotheses would therefore require long timeseries (probably several decades) of careful monitoring. While this process may accord with the canons of empirical science, it would not provide the timely information needed to inform current policy decisions on GHG emission abatement, so as to offset possible health consequences in the future. Nor would it allow early implementation of policies for adaptation to climate changes, which are inevitable ...” So it seems these results were based on a scientific short cut. (Indur Goklany, US Department of the Interior)	
E-8-33	A	3	21	3	2	How do the authors define a "standardised approach" to estimate the global burden of disease? (Paul Reiter, Institut Pasteur)	Not addressed; the CRA is a well established methodology within the health community
E-8-34	A	3	22	3	23	Change the beginning of the sentence commencing on line 22 to read as follows: "Climate change MIGHT increase the health burdens to 2030, UNLESS CURRENT ADAPTIVE CAPACITY EXPANDS -- AS IT MIGHT IF ECONOMIC AND TECHNOLOGICAL DEVELOPMENT INCREASE PER THE SRES SCENARIOS". [NOTE: New language is shown in UPPER CASE; deletions are not shown.] Rationale: See Goklany (2006a, 2005a) for detailed rationale. (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-35	A	3	22	3	24	“Will” means there is no uncertainty. I agree this is highly likely, but there are some uncertainties, e.g., the state of public health. Why pick 550 ppm? Seems arbitrary. Why not say impacts “are likely” to be reduced if emissions of greenhouse gases are reduced (carbon is not the only one). (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-36	A	3	23	3	24	Change the latter part of the sentence beginning with "These impacts..." as follows: "these impacts will be reduced in the medium term if carbon emissions are stabilized at 550 ppm OR IF ADAPTATION MEASURES ARE TAKEN TO REDUCE CLIMATE-SENSITIVE DISEASES THAT MIGHT BE EXACERBATED BY CLIMATE CHANGE. BECAUSE OF THE CO-BENEFITS ASSOCIATED WITH THE LATTER APPROACH --NAMELY, REDUCTION IN THE TOTAL BURDEN OF CLIMATE-SENSITIVE DISEASES RATHER THAN MERELY THE COMPONENT DUE TO CLIMATE CHANGE -- THE LATTER APPROACH WILL REDUCE THE BURDEN OF DISEASE BY A MUCH GREATER AMOUNT." [NOTE: New language is shown in UPPER CASE; deletions not shown.] For detailed rationale, see Goklany (2004, 2005a, 2006a).	Addressed

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						(Indur Goklany, US Department of the Interior)	
E-8-37	A	3	23	3	24	".....these impacts (e.g., health) will be reduced in the medium-term if carbon emissions are stabilized at 550 ppm". I have absolutely no idea upon what evidential basis anyone could make such a claim. Over what timeframe is "medium-term". Does this not depend on a multitude of other factors, such as trends in the strength of economies, public health systems, income distribution, technology development, adaptive actions etc etc? Where is this discussed in the chapter? (Peter Berry, Health Canada)	Addressed
E-8-38	A	3	23			This is an example of a confidence judgement, but there's no explanation for how this is arrived at. In an Exec Summary, this is OK, though. (Alan Krupnick, Resources for the Future)	Language, Based on the IPCC guidance on uncertainty
E-8-39	A	3	23			..to 2030; these impacts COULD (instead of will) (Alex von Hildebrand, WHO)	Language, Based on the IPCC guidance on uncertainty
E-8-40	A	3	26	3	26	should read 'undernutrition' (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-41	A	3	26			undernutrition (one word) (Clair Hanson, IPCC TSU)	Addressed
E-8-42	A	3	26			Section 5 the first sentence needs re-wording (Andrew Morse, University of Liverpool)	Addressed
E-8-43	A	3	28	3	29	There is no evidence given in Chapter 5, or in any of the literature that I am familiar with, supporting the statement that crop yields will increase with climatic change until at least the end of the 21st century. Rather, in the Executive Summary of Chapter 5 (page 3, lines 35-37) it is stated that 1-3 C warming will have small beneficial impacts on the major food crops in temperate regions, while for tropical regions (lines 39-41) we are told that even 1-2 C warming will have negative impacts for some major crops, and that more than 3 C warming will have negative impacts on all tropical crops. It follows then that 3 C warming (which could occur by mid century) is likely a threshold for the beginning of net negative effects, but the threshold could be much less (depending on the relative sizes of the impacts in temperature and tropical regions). On page 4 of Chapter 5 (lines 46-49) we are told that global food production should increase until 2020-2050 (which seems reasonable), followed by a decline to 2080, although no reason is given for the decline to stop in 2080. There is in fact very little global synthesis in Chapter 5, and what little there is, is quite vague (a point that I have raised in my Comments to Chapter 5). Clearly, the statements here have to consistent with what is said in Chapter 5, so for now I would just quote what Chapter 5 says concerning tropical	Addressed, reviewed based on chapter 5

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						and temperature crops but check to see if a meaningful global synthesis is provided in the final draft. (Danny Harvey, Dept of Geography, University of Toronto)	
E-8-44	A	3	28	3	31	"Food security" consists of more than the ability to produce food. It depends as much on the ability of individuals to obtain and buy food, as well as social safety nets. (Indur Goklany, US Department of the Interior)	Addresssed
E-8-45	A	3	28	3	28	Place "would" instead of "will" (Osvaldo Canziani, IPCC WGII Co-chair)	Addresssed
E-8-46	A	3	28			This very surprising conclusion (that global crop yields will increase but that experts are pessimistic about food security) demands more elaboration, even in the ES. (Alan Krupnick, Resources for the Future)	Addresssed
E-8-47	A	3	33	3	37	Since recent studies show that some of the sporozoans, alternating between the blood system of vertebrates and the digestive system of some vector (i.e mosquitoes), are showing increasing reproduction rates with higher temperatures, and because climate change influences the distribution and development of insect species, it would be better to redraft this paragraph, so to include this information. Therefore, it could say: 6. Climate change influences the distribution and development rate of health-relevant insects as well as higher temperatures would increase the infectiousness of some parasites (plasmodia in mosquitoes species); therefore, leaving aside the other factors on which VBDs depend, the Earth 's warming would lead to an increase in potential for disease transmission. Consequently, projected changes etc". (Osvaldo Canziani, IPCC WGII Co-chair)	Partly Addresssed; too little evidence to generalize that temperature increase, increases the infectivity
E-8-48	A	3	33	3	6	"Insects" should be replaced by "arthropods". Ticks, for example, are not insects (Paul Reiter, Institut Pasteur)	Addresssed
E-8-49	A	3	34			full stop after] and capital W (Clair Hanson, IPCC TSU)	Addresssed
E-8-50	A	3	36	3	36	Comment: Excellent point re: increasing pressures on disease control activities (Kim Knowlton, Columbia University)	Not Addresssed
E-8-51	A	3	36	3	37	"...will increase the pressures on disease control activities". Why are we concerned about pressures on disease control activities? In fact, such pressures can arise from a variety of non-climate related sources (e.g., change in government priorities, other health issues, technology development etc). Would it not be better to indicate climate change will increase the need for disease control activities, which is much more relevant to a discussion about health risks?	Addresssed

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						(Peter Berry, Health Canada)	
E-8-52	A	3	37			Add a new sentence at the end of this para that reads as follows: "ON THE OTHER HAND, INCREASED LEVELS OF ECONOMIC AND TECHNOLOGICAL DEVELOPMENT CONSISTENT WITH SRES SCENARIOS (WHICH WOULD ALSO ENHANCE SOCIAL AND HUMAN CAPITAL) COULD REDUCE THESE ADDITIONAL PRESSURES, IN ADDITION TO CURRENT PRESSURES." For rationale, see Goklany (2006a). (Indur Goklany, US Department of the Interior)	Not Addressed; too long in ES
E-8-53	A	3	39	3	41	Why not medium-high confidence? I am not sure what criteria was to ascertain the degree of confidence, but I would have thought that medium high confidence could be used here given that almost all models looking at malaria have shown some degree of increase. (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-54	A	3	39	3		In my opinion, there is little true "research" in this field. There are modelling exercises and there are a few articles that are speculative rather than investigative. (Paul Reiter, Institut Pasteur)	Not Addressed
E-8-55	A	3	40	3	40	The lack of information from any areas of the world, as reported in the chapter 's text, would suggest that the argument arising from the term "is" should be replaced to read "might be" or "may be" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-56	A	3	40			Same here with respect to malaria. The conclusion is surprising and needs somewhat of an explanation (Alan Krupnick, Resources for the Future)	
E-8-57	A	3	43	3	47	Comment: Great point about possible "first deaths that can be attributed to climate change" (Kim Knowlton, Columbia University)	Not Addressed anymore
E-8-58	A	3	43		47	My science friends say that katrina cannot be linked to climate change, although such a linkage is plausible. So I think this para oversells. In addition, I think it is sort of absurd to claim that the casualties from the European heat wave and katrina may be the first death attributable to climate change. Any increase in frequency or severity of heat waves or hurricanes in the last decade probably could be candidates for such a claim, particularly since a link with anthropogenic emissions is not being made here. (Alan Krupnick, Resources for the Future)	Addressed
E-8-59	A	3	44	3	45	Modify the phrase "may not be well prepared for extreme weather events" to read as follows: "WERE NOT well prepared for SPECIFIC extreme weather events,	Not Addressed

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						DESPITE THEIR CONSIDERABLE ADAPTIVE CAPACITY." (Indur Goklany, US Department of the Interior)	
E-8-60	A	3	44	3	45	"This event and Katrina showed that developed countries may not be well prepared for extreme weather events." This is an oversimplification. Where is capacity of developed countries investigated in detail in the chapter to support this statement? Over an 18 month span (I believe 2003-2005) the state of Florida experienced and responded to 6 or 7 major hurricanes. It would appear that the state coped with these events - which would seem to be a major accomplishment. How is this weighed against the devastation brought by Katrina? The analysis about capacity needs to be more sophisticated to support such strong statements. (Peter Berry, Health Canada)	Addressed
E-8-61	A	3	44			The comment that developed countries may not be well prepared for extreme events is a general and sweeping observation and therefore, ought to be based on more than just two extreme events. The two events cited demonstrate that large extreme events can cause major problems even for developed countries. What does it mean to be well prepared? (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-62	A	3	45	3	46	Where does the claim "very unlikely" originate? In meteorological terms, the heat wave was due to a stable anticyclone in the North Atlantic that drew hot air from the south. In global terms, there was nothing unusual about the event. Further east, and to the west, temperatures were below average. It will be interesting to see what WGII say about the issue. Even if the event was "the hottest since the year 1500", it is surely inadmissible to select an isolated anomaly in a relatively small geographic area and to state that the heat wave was "very unlikely in the absence of anthropogenic climate change", or that "the casualties may "the first deaths that can be attributed to climate change". Moreover, the statement contradicts the other examples of climate change impacts that the draft claims are "already" occurring (e.g. vector-borne diseases moving to higher altitude). After all, heat waves have occurred in the past, and if one did occur in the year 1500 ... it was natural. In the same way, it is often stated that temperatures have not been so high for 1000 years; it is very unlikely that this period, the "Medieval Optimum, was due to anthropogenic climate change, nor the previous warm period 6000 years before. (Paul Reiter, Institut Pasteur)N	Not Addressed; 4AR guidance on uncertainty
E-8-63	A	3	45	3	46	Change: "Given that a heat wave as severe as that in Europe in 2003 is very unlikely to have occurred in the absence of anthropogenic climate change" to "Given that some climatologists now consider that human influence on global climate may have more than doubled the risk of a heat wave such as experienced in	Addressed

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						Europe in 2003". The conclusion in the Executive Summary is not justified by the underlying text, which in itself is an overstatement of what Stott, et al (2004) concluded. This proposed wording is consistent with WG I's assessment of this reference. (See Chapter 9, Pg. 84, line 37 of WG I's SOD). (Lenny Bernstein, L.S. Bernstein & Associate, L.L.C.)	
E-8-64	A	3	46			...the casualties may include the first RECORDED deaths (von Hildebrand, WHO)	Addressed in 8.2
E-8-65	A	3	47	3	47	consider inserting "directly" before "climate change" (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-66	A	3	47			Add a new sentence at the end of this para to read as follows: "HOWEVER, IF LESSONS FROM THESE EVENTS ARE APPLIED, LOSSES FROM SUCH EVENTS COULD BE SUBSTANTIALLY REDUCED IN THE FUTURE." (Indur Goklany, US Department of the Interior)	Not Addressed, completely changed
E-8-67	A	3	49	3	49	replace relation with relationship (Andrew Morse, University of Liverpool)	Not Addressed; completely changed
E-8-68	A	3	51	3	51	Comment: Excellent point re: need for more reesarch focused on temperaure mortality in less developed countreis (Kim Knowlton, Columbia University)	Addressed
E-8-69	A	3		4		ES: there isn't a natural/logical progression of the statements in the ES. Would suggest the following order: 1, 2, 4, 10, 3, 5, 12, 9, 11, 8, 6, 7, 13-17 (Clair Hanson, IPCC TSU)	Addressed
E-8-70	A	3				Please check sourcing in ES (Paul van der Linden, Met Office)	Addressed
E-8-71	A	4	1	4	1	Taking into account that higher temperatures in winter time would have positive impact on health, particularly for aged persons, it would be better to insert "excessive" before heat. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-72	A	4	2			Replace "will not" with "MAY not", because we don't know one way or the other for sure, although one might have suspicions about this.. (Indur Goklany, US Department of the Interior)	Not Addressed; ES completely changed
E-8-73	A	4	4	4	7	Please see my comments above about statement concerning health benefits of climate change. (Peter Berry, Health Canada)	Addressed
E-8-74	A	4	4	4	4	May we say "will have" when there are still a number of ill-known factors about, let us say the effect of internal migrations caused by different crucial issues, such as reduction in food production or lack of freshwater resources, vis a vis of a still	Addressed, using IPCC guidance on uncertainty

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						increasing global population ?. Before thes and othe potential stresses, it would be better to say: “ Climate change may bring some etc”. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-75	A	4	4	4	5	I suggest you specifically note that in many countries the incidence of cardiovascular disease is larger when temperatures (especially night-time) are low. So a warming (especially of winter night-time temperatures, should lead to a reduced incidence of cardiovascular disease. I dont think this will be very strong, based on the relationships I have seen between temperature and incidence, but it is worth noting. (Neville Nicholls, Monash University)	Addressed
E-8-76	A	4	4	4	4	Climate change MAY havefactor. (Paul Epstein, Harvard Medical School)	Addressed
E-8-77	A	4	7			Increased climate variability may contribute to increased mortality from winter illnesses, including viral diseases and weather-related accidents and trauma. (Paul Epstein, Harvard Medical School)	Addressed
E-8-78	A	4	8			Insert a new paragraph on line 8 that would read as follows: “Despite the recent spate of deadly extreme weather events such as the 2003 European heat wave and the hurricanes of 2004 and 2005, data from EM-DAT, the International Disaster Database maintained by the Office of Foreign Disaster Aid and Center for Research on the Epidemiology of Disasters at the Université Catholique de Louvain, Brussels, Belgium, indicates that aggregate mortality and mortality rates due to extreme weather events are generally lower today than they used to be in earlier decades. Globally, mortality and mortality rates have declined by 95 percent or more since the 1920s. The largest improvements came from declines in mortality due to droughts and floods, which apparently were responsible for 95 percent of all deaths caused by extreme events during the 20th century. For windstorms, which contributed most of the remaining 5 percent of fatalities, mortality rates are also lower today but there are no clear trends for mortality.” References: Goklany (2006b, 2005b). (Indur Goklany, US Department of the Interior)	Addressed
E-8-79	A	4	11		12	does the fish poisoning (ciguatera) mean that fish are poisoned or that people who eat the fish are poisoned? If the latter then the sentence needs rephrasing (Clair Hanson, IPCC TSU)	Addressed
E-8-80	A	4	12	4	12	It is understood that the name "ciguatera" is applied in the Caribbean region. Therefore, since the IPCC reports shall serve users in the different regions of the world, it would be better to cancel the qualification here and, in the bulk of the chapter cross-refer the use of the word ciguatera with the corresponding	Addressed

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						information from that particular region (the Caribbean). Moreover, it is not only fish poisoning but also other "fruit de mer" poisoning and the algae blooming producing other negative effects on sea food (in Latin America there is forbidden to fish under "marea roja", i.e when the algae blooming adversely affects fishes and other sea species. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-81	A	4	12		fish poisoning (ciguatera) and biotoxin illnesses from harmful algal blooms in tropical.....Vibrio spp. and other shellfish-related diseases may occur with increasing frequency at higher latitudes (McLaughlin, Joseph B., DePaola, Angelo, Bopp, Cheryl A., Martinek, Karen A., Napolilli, Nancy P., Allison, Christine G., Murray, Shelley L., Thompson, Eric C., Bird, Michele M., Middaugh, John P.Outbreak of Vibrio parahaemolyticus Gastroenteritis Associated with Alaskan Oysters N Engl J Med 2005 353: 1463-1470). (Paul Epstein, Harvard Medical School)	In chapter 1
E-8-82	A	4	14	4	17	Should we be correct, the second sentence of this paragraph should also mention a similar impact from droughts. Therefore, it is suggested to bridge this issue by slightly modifying the second sentence to read: "Increases in frequency and intensity of extreme events, namely floods and droughts, will test the capacities of hydrometeorological watching and alert systems and the integrity of water management regarding the control and alert of water-borne diseases." (Osvaldo Canziani, IPCC WGII Co-chair)	Partly Addressed
E-8-83	A	4	17	4	17	increase "in" waterborne diseases (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-84	A	4	21	4	21	P4 Line 21: Dust storms from Africa and China are affecting air quality in the Caribbean and southern US East Coast, and the US West Coast, respectively. (Paul Epstein, Harvard Medical School)	Addressed, paragraph revised
E-8-85	A	4	23	4	26	Since increasing surface temperatures lead to increasing wildfire conditions in forest and rangelands, it is important to inform decision making on the increasing health problems stemming from wildfires, as well as provoked fires to expand the agriculture frontier. The emission of gases and particulates is critical as it is their transboundary dissemination. It is then suggested to add, after pollutants, particularly gases and particulate emissions from wildfires in forests, woods and rangelands. For further information see: "A review of factors affecting the human health impacts of air pollutants from forest fires", from Health Guidelines for Vegetation Fire events, Lima Peru, 6-9 October 1998=WHO, and the Summary on Scientific Studies on Health Effects of Woodsmoke and Particulate Matter Air Pollution= Bay Area Air Quality Management District, December 2004	Addressed, also addressed in TAR

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						(Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-86	A	4	25	4	25	cost-benefit comparisons of what? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-87	A	4	25			Where does the finding about worker productivity come from? This is a complex topic. There may well be gains for many workers resulting from less cold weather, e.g., increased period for construction in mid and high latitudes. If the conclusion is based on the discussion in Section 8.2.9, it should be substantially caveated or withdrawn. The analysis in Section 8.2.9 only examines increase in heat stress, not reduction in cold stress. (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-88	A	4	26	4	26	Since it is known that increased surface ozone concentration affects workers in physical or mental activities, this fact should be included. The end of the paragraph should then read: to heat stress and increased surface ozone concentrations. (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed specifically for workers but overall populations;
E-8-89	A	4	26	4	26	...and water- and vector-borne diseases. (Paul Epstein, Harvard Medical School)	Addressed
E-8-90	A	4	26			Append at the end of the last sentence, the following: "UNLESS THE ADAPTATION MEASURES ARE SUCCESSFUL." Rationale: Note that productivity in the southern part of the United States, for instance, is far greater today than it has ever been, in large part because of adaptive measures such as air conditioning. This is also true in other areas with warm climates, e.g., India. Siestas, which were de rigueur 40 to 50 years ago, are now dispensed with by many with access to air conditioned offices, stores, etc.. (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-91	A	4	28	4	34	Expert Review: On the Executive summary; Expert Reviewer suggests that the following description would insert the text. 1) Since economic development will not insulate the world's population, it should prevent the displacement to risky areas by low income population in vulnerable communities of industrialized countries, developing countries and countries with economies in transition from the impacts of climate change. (Mitsuru Ando, Toyama University of International Studies)	Not Addressed
E-8-92	A	4	29	4	29	Place "free" or "release" instead of "insulate" (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed
E-8-93	A	4	29			Suggest changing "insulate" to "protect" (Peter Berry, Health Canada)	Not Addressed
E-8-94	A	4	30	4	31	Replace "On current trends, many people will not benefit from ...climate change " with the following: "NOT ALL PEOPLE WILL BENEFIT EQUALLY FROM	Addressed

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						IMPROVED MATERIAL PROSPERITY." Rationale: O(a) The substitute is more correct, (b) the current statement has not been proven; there has been no showing that the increase in adaptive capacity due to improvements in economic development accompanied by secular improvements in technology -- which should be part and parcel of "current trends" -- will not benefit everyone, although it is quite likely that not all will benefit equally. See Goklany (2006a). This is supported by historical experience which indicates that historically over the long term benefits of technology have filtered through to poorer societies (and poorer segments of society). See Goklany (2002, 2001). (Indur Goklany, US Department of the Interior)	
E-8-95	A	4	30			On current trends... This is an important statement that needs to be carefully written. You could say that only with a substantial improvement in public health, could risks of climate change be substantially reduced. What has the literature on the effect of the SRES scenarios on probable changes to public health indicated? (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-96	A	4	31			Replace "Critically important will be the manner ..." with the following: "THE EXTENT TO WHICH POORER SEGMENTS OF SOCIETY WILL BENEFIT WILL ALSO DEPEND ON THE manner..." For rationale, see above entry. (Indur Goklany, US Department of the Interior)	Addressed
E-8-97	A	4	32			Add on line 32, the following new material after the last comma on line 32:"THE METHODS AND MECHANISMS BY WHICH THESE BENEFITS ARE DISTRIBUTED, ..." For rationale, (1) see Barro (1997). (2) If distribution was all that matters, the Soviet Union would have had the best public health record. [Reference: Barro, R. J. 1997. The Determinants of Economic Growth: A Cross-Country Empirical Study. Cambridge, MA: MIT Press.] (Indur Goklany, US Department of the Interior)	Addressed
E-8-98	A	4	36			A sentence or two to mention the community based IPVM approach to better deal with pest and disease outbreaks, see also under 8.6.1.3. (von Hildebrand, WHO)	Not Addressed
E-8-99	A	4	39	4	40	Recent developments show that some National Meteorological Services are producing "health forecasts and advisories (Geddes N. "And now for today 's health forecast", New Scientist, 11 February 2006, page 44). Therefore, it would be opportune to reflect these developments in these lines, so to say: "...as well as predictions of infectious and other diseases, either seasonal or daily". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-100	A	4	48			Distributed generation (DG) with clean energy systems can be adaptive. Systems with wind, solar and human powered energy generation (e.g. bicycles attached to	Not addressed

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						water pumps) can improve public health by pumping water, powering irrigation, powering lights for reading and studying, for small enterprises (e.g. sewing machines), and cooking (saving forest used for fuel). The multiple benefits of DG for public health, agriculture, cooking and small businesses can all contribute to poverty alleviation, thus decreasing overall vulnerability to climate change. Where they feed into grids, DG clean energy systems can improve energy security, when the grid or supplies of fuels are disrupted due to storms, heat waves and black outs, loss of forests, over heating of water (shutting down energy (including nuclear) plants), loss of hydropower and international conflicts. (Paul Epstein, Harvard Medical School)	
E-8-101	A	5	1	5	9	Comment: Section 8.1 "Introduction" offers conide summary of "important gaps in information for the more vulnerable populations..." (Kim Knowlton, Columbia University)	Addressed
E-8-102	A	5	3	5	5	After climate change, in line3, it is suggested to read: "provides information on current and future possible health stresses and risks, and the strategies, policies and measures that have been recommended, and should be implemented, to reduce human vulnerability and the impacts of climate and environmental changes on human beings (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-103	A	5	5	5	5	"Knowledge" is a misnomer. "Evidence" would also be an exaggeration, because much of the new literature refers to models; these cannot be regarded as "knowledge" nor "evidence". "The chapter reviews peer-reviewed articles that have been published since ..." would be more accurate, but this approach is flawed. A scientific review of complex issues cannot be restricted to a five year period, just as global change cannot be measured over short time periods. The context of our understanding of these issues does not date to the period 2001-2006. (Paul Reiter, Institut Pasteur)	Not Addressed
E-8-104	A	5	6	5	6	Regarding the reference on research, the efforts to develop mathematical models and new theories are not only empirical but also theoretical. Therefore, it is suggested to read "theoretical and empirical research". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-105	A	5	6	5	7	Again, "... empirical research on the early effects of climate change ...". In recorded history, there are plenty of interesting examples of climate change, hotter and colder", and there is plenty of "empirical evidence" that is contrary to the "evidence" cited in recent papers. For example, in my field (vector-borne disease) the "empirical research" on malaria is hotly challenged by specialists (see below), and climate as a principal factor in malaria transmission (in Europe) was already	Not addressed

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						rejected in the 1920s.. As I stressed in my first review, in a document of this kind, BOTH SIDES of the debate must be CLEARLY EXPLAINED FOR EVERY EXAMPLE, as many readers are unlikely to read beyond the Executive Summary. For this reason, in 2004, a consortium of the world's top specialists in vector-borne diseases published an appeal for greater accuracy in this debate (Reiter P, Thomas CJ, Atkinson P, Hay SI, Randolph SE, Rogers DJ, Shanks GD, Snow RW, and Spielman AJ. 2004. Global warming and malaria: a call for accuracy. The Lancet, Infectious Diseases (4): 323-324. We were serious in this call; we and many other colleagues, feel strongly that this debate is being driven, for various ends, by persons who have little knowledge of our field. (Paul Reiter, Institut Pasteur)	
E-8-106	A	5	15	5	15	"and reduces adaptive capacity" for what? Maintaining health generally, or adapting to climate change and health impacts? (Peter Berry, Health Canada)	Not addressed, glossary
E-8-107	A	5	16	5	16	suggest replacing "struggle with stresses of all kinds..." to "are less able to cope with a variety of stresses, including those related to climate change, then are healthy people." All people struggle with stresses of all kinds - people with high rates of disease have more difficulties coping than do others. (Peter Berry, Health Canada)	Addressed
E-8-108	A	5	16	5	16	replace injury with debility (Andrew Morse, University of Liverpool)	Addressed
E-8-109	A	5	16	5	16	Replace " against" in the place of "with" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-110	A	5	22	5	23	Replace the sentence beginning on line 22 with the following: "Although, inequalities in health persist between countries, in the past 50 years these inequalities declined significantly, but since the 1980s, they have begun to widen once again in some areas, especially in areas that suffered from economic decline and/or were heavily afflicted by a brand new disease (specifically, HIV/AIDS) or a resurgence of malaria and tuberculosis (Goklany 2002)" This is more accurate. (Indur Goklany, US Department of the Interior)	Addressed
E-8-111	A	5	22	5	22	It will be more direct to read: "However, improvements are not evenly distributed into all regions and substantial inequalities in health care services persist, etc". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-112	A	5	25			To "HIV/AIDS", add "and resurgence of malaria and TB (Goklany 2002)." (Indur Goklany, US Department of the Interior)	Not addressed, although we agree with the reviewer that it is very important
E-8-113	A	5	31			p5 line 31 et seq. Appears odd to single out immunization without reference to contribution of primary prevention	Addressed

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						Water restrictions in response to scarcity (developed and developing) and adverse health effects as adaptive measures are introduced appear to be omitted (Jamie Bartram, Water, Sanitation and Health Programme)	
E-8-114	A	5	32	5	32	Place "transmittable" instead of "communicable" (Osvaldo Canziani, IPCC WGII Co-chair)	Not addressed, as commonly diseases are distinguished into communicable and non communicable diseases; suggest to glossary
E-8-115	A	5	36	5	36	Read "non-transmittable" instead of "non communicable" (Osvaldo Canziani, IPCC WGII Co-chair)	Not addressed
E-8-116	A	5	36	5	36	add '...even taking ageing into account.' at the end of this sentence (Andy Haines, London School of Hygiene & Tropical Medicine)	Not addressed
E-8-117	A	5	40	5	51	what about chronic diseases - many of which are becoming epidemic in developed countries such as Canada? (e.g., increases in diabetes among northern Canadians if traditional foods disappear, high sensitivity of people with HIV or cancer to water and food-borne contamination related to climate variability, obese people dealing with heatwaves etc etc) (Peter Berry, Health Canada)	Addressed
E-8-118	A	6	10	6	10	In this bullet, add "drought" within the brackets.. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-119	A	6	18			can 'other changes' be expanded upon? (Clair Hanson, IPCC TSU)	Addressed
E-8-120	A	6	21			replace 'decreases and' with 'decrease' (Clair Hanson, IPCC TSU)	Addressed
E-8-121	A	6	34	6	34	The well known fact that in many countries, in particular in developing ones, data and allied socio-economic information are definitely scarce , suggest to amend this phrase. It would be more correct to say:" More studies that investigate the effects of climate and climate change, in the context of social, economic and environmental context of the disease risks are now available; however this is not the case in many developing countries" . The reference on the Izmerov et al paper should be passed to the previous sentence." (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-122	A	6	35	6	37	Require some references for climate-health impact models (Andrew Morse, University of Liverpool)	Addressed
E-8-123	A	6	36	6	36	Place "progress" instead of "advancement" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-124	A	6	37			later --> latter (Clair Hanson, IPCC TSU)	Addressed
E-8-	A	6	38	6	38	There is no doubt that this is true, and of course, such assessments are totally	Not addressed; assessments have been carried

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125						justifiable. Nevertheless, it is also clear that much of the concern is generated by politics, not science. Statements from specialists that challenge the "knowledge' available to the public are all too frequently dismissed as those of a minority of "skeptics". I state this from experience, and as an opinion, not as a challenge to the statement. (Paul Reiter, Institut Pasteur)	out by national research institutions in most of the countries, through wide scientific consultation Addressed processes and empirical research.
E-8-126	A	6	38	6	40	How do you define such "climate-specific" adaptation measures? Do they need to be specific to climate related diseases? Do they need to incorporate considerations of risks that future climate change will bring to populations (e.g., use of scenario information)? If you accept a broad definition of adaptation measures that include things such as (smog alerts, enhancing emergency preparedness plans, improving surveillance of infectious diseases, upgrading water treatment plants, providing health promotion advisories on UV radiation exposure etc etc) then you should indicate that "many" climate-sepecific adaptation measures have been developed. If you accept a more narrow definition - one that requires some consideration in development of adaptation measures of how future climate variability will affect risks to health (e.g., some communities may now experience smog levels harmful to health because of increasing temperatures) then you should indicate that "few" measures have been developed, in my view. (Peter Berry, Health Canada)	Addressed, in 8.6
E-8-127	A	6	40	6	41	The information give above, on the availability of health forecasts and warnings, should be used to close this paragraph 8.1.3 (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed here -
E-8-128	A	6	40			Section 8.1.3 - the European heatwave of 2003 and Hurricane Katrina have demonstrated that populations in high income countries may be vulnerable to climate change (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-129	A	6	48	6	48	It is not always the meteorological extreme event that is important but a run of events that leads to a health impact e.g. a run of much higher than average but perhaps not 'extreme' or record breaking night time minimum temperatures - high impact weather might be a better term? (Andrew Morse, University of Liverpool)	Not addressed – to be consistent with other chapters and wg1
E-8-130	A	6	50	6	51	"Explanatory variable" is not an accepted term. It should be replaced by "may be a significant variable" or "is a parameter that may contribute to..." or "may play a dominant role in". Science, in this complex issue, cannot deal in certainties. (Paul Reiter, Institut Pasteur)	Addressed
E-8-	A	7	0			Table 8.1 row 8 India col 2 10% increase? In area	Addressed

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131						(Andrew Morse, University of Liverpool)	
E-8-132	A	7	0			Table 8.1 row 7 Germany col 2 define TBE? (Andrew Morse, University of Liverpool)	Addressed
E-8-133	A	7	8	7	26	The text suggests that very little confidence can be placed in the current estimates of health effects of climate change, and even less on the future estimates of these impacts. Accordingly, this should be noted on line 27, and confidence estimates for such effects should be adjusted in this chapter to reflect this reality. (Indur Goklany, US Department of the Interior)	Addressed
E-8-134	A	7	8			A major challenge is also that many poor countries' health sector, in general is not aware or has not fully accepted the links between environmental factors and health outcomes (example asthma and air quality or even diarrhea and dirty water). In the case of climate change the causal effect relationship is even less distinguishable. Stepwise, poor countries' health sector should be encouraged to, first, increase capacity in environmental health. (von Hildebrand, WHO)	Partly addressed
E-8-135	A	7	9	7	9	There are also gaps in climate data especially in Africa where the data exist in the grey literature or in paper archives (Andrew Morse, University of Liverpool)	Addressed
E-8-136	A	7	9	7	9	After and, add "related socio-economic information". Further, it does not pertain to the population to collect and analyze this type of information, it is the government and private entities' obligation. Therefore, it would be better to place "developing countries" instead of "low-income populations". (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed; we decided throughout the chapter to use low income countries, rather than developing countries
E-8-137	A	7	12	7	12	The "difficulty of attributing health outcomes..." suggests bias. A more appropriate wording would be: "the complexity of systems that contribute to infection and other health issues". (Paul Reiter, Institut Pasteur)	Not Addressed – the issue of attribution is common language used in environment and health – and captures more than the complexity of systems
E-8-138	A	7	12	7	12	Can climate variability be added to climate and climate change? (Andrew Morse, University of Liverpool)	Addressed
E-8-139	A	7	14	7	14	Here again, I suggest that "complexity" is a key word. (Paul Reiter, Institut Pasteur)	Addressed
E-8-140	A	7	17	7	17	Assuming that we agree with the WHO definition for health, it would be more appropriate to slightly modify this bullet to say "for people's health, wellbeing and comfort, in different population settings" (Osvaldo Canziani, IPCC WGII Co-chair)	Not addressed
E-8-141	A	7	23	7	23	delete "occurs" and replace with "occur" (Julius Fobil, School of Public Health, College of Health Sciences, University of	Addressed

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						Ghana)	
E-8-142	A	7	25	7	26	I thoroughly agree with the statement: "Assessments of health impacts require robust evidence of causal effects from a variety of populations and settings to reach the expected high standards of evidence", although I would leave out the term "causal effects". A careful review of the table, however, does not convince me that the assessments that are quoted are of "high standard". To begin with, in my opinion, there should be a statement that most (all?) of these are not peer reviewed. The summaries are also misleading. For example: there cannot be an "increase in malaria in Portugal" because there is no malaria there, and has not been for more than 50 years. I have also checked the bibliographies of the authors of the report. I found no publications for Casimrio, and four for Calheiros—"Childhood lead exposure in Oporto, Portugal; "Post-natal depression in an urban area of Portugal": "Comparison of childbearing women and matched controls"; "Headaches in medical school students". Surely not specialists in malaria, nor in any other climate-related health field? For the Netherlands (Bresser) I found two: "Model study on the role of wetland zones in lake eutrophication and restoration"; "Voice identification of prepubertal boys and girls by normally sighted and visually handicapped subjects". For Germany, I found one for Zebisch: "Ultrasound-guided liver biopsy in birds"; none for Grothmann; 42 for Schroeter, but all on molecular immunology; 61 for Hass, but all on parathyroidism; and none for Cramer , W, unless he was the author of three papers on waste disposal: "Packaging characteristics of disposables"; "Collections: a matter of salesmanship"; "Developing a collection policy that works". Lastly, there are some rather narrow-viewed predictions. For example, will the indigenous peoples of Australia retain their traditional life-style in 50 or 100 years time? Will the current displaced, impoverished communities continue to live in the misery in peri-urban areas? (Paul Reiter, Institut Pasteur)	Partly Addressed; the impact assessments are complex assessments, where numerous experts contribute to; the authors mentioned are the convening authors or editors. We agree that some of these assessments have not been peer reviewed, and belong to the grey literature, e.g. Zebisch – nevertheless others like UK and Portugal have gone through an extensive international review!
E-8-143	A	7	28			Table 8.1 Are these studies reported without analysis or comment? My concern is on reporting increased anxiety and depression in Canada. It seems quite a speculative finding. One has to wonder how mental health can be forecast decades from now. We need to be careful of these kind of findings that put the IPCC at risk of being dismissed as full of speculation and overreaching. (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-144	A	7	28			Please mention aspects related to the WHO/UNDP GEF funded 6 country project (von Hildebrand, WHO)	Not Addressed, as no documents are yet available
E-8-145	A	7	28			Bhutan finalised its NAPA (I have copy of it) (von Hildebrand, WHO)	Addressed

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E-8-146	A	7				Table 8.1 explain "GLOFs" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-147	A	7				T8.1: under adaptation 4th cell down 'health island' --> 'heat island' (Clair Hanson, IPCC TSU)	Addressed
E-8-148	A	7				T8.1: under adaptation 3rd cell down 'rising' --> 'raising' (Clair Hanson, IPCC TSU)	Addressed
E-8-149	A	8	0	8	0	Table 8.1 Information on Portugal Needs to be corrected to " Increase in heat-related deaths and malaria table 8.4, 8.5), food and water borne diseases; west Nile fever, leishmaniasis, Lyme disease, and Mediterranean spotted fever; a reduction in leptospirosis risk in some areas." (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Addressed; should be leishmania, not leptosporidiosis as the Addressed reviewer asks
E-8-150	A	8	3	24	13	Comment: Section 8.2 "Current Sensitivities" includes numerous descriptions of global research efforts & cites numerous non-North American/European studies (Kim Knowlton, Columbia University)	Addressed
E-8-151	A	8	9	9	10	should briefly explain figure 8, including why use dashed line and real line at the same time in one figure, the meanings of these two types of line. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Figure is changed
E-8-152	A	8	13	8	14	As already mentioned, it is not only the vector 's populations which are affected but also the infection agents (i.e. sporozoans=plasmodia).Therefore, this idea shall be added. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-153	A	8	15	8	15	Under a given climate system or setting, there would be few modifications in the temporal and spatial distribution of the mentioned diseases. However, "climate variations", or better "climate change" plays that role. Therefore, this bullet should be redrafted to say so. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-154	A	8	16	8	16	Place "food and water borne diseases" instead of "diarrhea diseases". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-155	A	8	17	8	17	replace "cause" with "can cause". Whether such events "cause" large increases in deaths depends on how extreme the temperatures are and how effective the adaptation is. WHO has argued that most of the 35 000 deaths in 2003 heatwave in Europe were preventable which suggests extreme temps need not cause large increases in deaths. (Peter Berry, Health Canada)	Addressed
E-8-156	A	8	17			instead of "extreme temperatures" "extreme heat load" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Not Addressed; unfortunately epidemiological studies still mainly take into consideration temperature and a few other variables.

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							Therefore it is not possible yet to call it heat load
E-8-157	A	8	18	8	18	Replace "may be" instead of "are" and add, after long-lasting, "both physically and economically". Further, add droughts after flooding. Therefore, this bullet should read: * the health effects of flooding, drought and weather may be severe, both physically and economically" (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed
E-8-158	A	8	18	8	18	replace "are" with "can be". Again, this sentence ignores the magnitude of the event and the effect of adaptation on reducing health impacts. For example, one need simply compare the human health outcomes normally associated with a hurricane in USA vs one in a developing country - the difference in deaths and injuries is usually very great due to greater adaptive capacity in the developed country (Peter Berry, Health Canada)	Not Addressed; very or no adaption yet
E-8-159	A	8	18			Add "Although" at the beginning of this bullet and append the following at the end (before the period, i.e., full stop): "data from EM-DAT, the International Disaster Database maintained by the Office of Foreign Disaster Aid and Center for Research on the Epidemiology of Disasters at the Université Catholique de Louvain, Brussels, Belgium, indicates that aggregate mortality and mortality rates due to extreme weather events are generally lower today than they used to be in earlier decades. Globally, mortality and mortality rates have declined by 95 percent or more since the 1920s. The largest improvements came from declines in mortality due to droughts and floods, which apparently were responsible for 95 percent of all deaths caused by extreme events during the 20th century. For windstorms, which contributed most of the remaining 5 percent of fatalities, mortality rates are also lower today but there are no clear trends for mortality." References: Goklany (2006b, 2005b). (Indur Goklany, US Department of the Interior)	Partly Addressed; EMDat in acronyms?
E-8-160	A	8				T8.1: under KVs 1st cell down - what is TBE? Please define (Clair Hanson, IPCC TSU)	Addressed
E-8-161	A	9	1	9	19	spatial vector distribution could be added. (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-162	A	9	1	9	18	In Pathways diagram (Fig 8.1) why is "Health system determinants" set apart from social determinants? Do health system determinants play such an exceedingly important role so as to equal that played by all other social determinants? This could be the case for developing countries in which case this should be highlighted. Current diagram seems to go against most formulations of factors that have been	Figure has changed

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						identified as being important for climate change and health adaptive capacity. they often list "institutions" (e.g., health system etc) along side other factors such as equity, economic resources etc. (Peter Berry, Health Canada)	
E-8-163	A	9	9			figure8.1, the words of "climate change" should be in the middle of frame. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Figure is changed
E-8-164	A	9	19			Figure 8.1: I think it is appropriate to add arrows from the social determinants box to the environmental determinants box and the health sustem determinants box, as there are clearly causal links there. (Alan Krupnick, Resources for the Future)	Figure is changed
E-8-165	A	9	19			Figure 8.1 Needs redrawing / simplifying and lacks clarity (Andrew Morse, University of Liverpool)	Figure is changed
E-8-166	A	9	19			Figure 8.1 - title should delete '..on how..' and insert ...by which..' (Andy Haines, London School of Hygiene & Tropical Medicine)	Figure is changed
E-8-167	A	9	22			table 8.2 is very disorderly, and it is also not integrated, should draw a baseline, and the word of "cause of death (deaths(1000s))" should be moved to up line. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Table deleted
E-8-168	A	9	22			Table 8.2 - this table is not about disease burden but numbers of deaths due to climate sensitive conditions (Andy Haines, London School of Hygiene & Tropical Medicine)	Table deleted
E-8-169	A	9	22			Of course, you will use the latest data published in WHO's report on BOD from the environment, issued this year: Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease at: http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/index.html (von Hildebrand, WHO)	Table deleted
E-8-170	A	9	22			Do you have table 8.2 (which is current disease burden) for 2030, 2050 and 2100 under different scenarios. Now that would be both interesting and useful. You may have to construct it from a number of sources but it would be well worth it. (Paul van der Linden, Met Office)	Table deleted
E-8-171	A	9	26	9	30	Line 26 says that Table 8.3 includes information from the Regional chapters. Since in some cases these chapters has failed to include some important regional diseases, the Chapter 8 s authors should check this table. For instance, there is no reference to the Chagas disease (trypanosomiasis americana) with more than 20 million of persons infected. (Osvaldo Canziani, IPCC WGII Co-chair)	Table deleted
E-8-	A	9	26			write out 4th in full and capitalise A and R	

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172						(Clair Hanson, IPCC TSU)	
E-8-173	A	9	30	9	30	Table 8.3 - Best to say what "AR4" is. (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Table deleted
E-8-174	A	9	30			Table 8.3 can this be sorted into major health sections in other chapters? (Andrew Morse, University of Liverpool)	Table deleted
E-8-175	A	9	30			8.2. pg 9,10 I propose that Table 8.3. go to a chapter appendix and should be referred to in the text where the table is currently located. (Rainer Sauerborn, Heidelberg University)	Table deleted
E-8-176	A	9	30			1. table 8.3 should be deleted. Because the contents related to human health appear in other sections of 4AR, should not specially point out by a table. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Table deleted
E-8-177	A	9				T8.3: heading in the 2nd column 4AR --> AR4 (Clair Hanson, IPCC TSU)	Table deleted
E-8-178	A	9				F8.1: what do the red and dashed lines represent? Please explain in the figure caption. Are there arrow heads missing from the links between env. Determinants and health system determinants? Should there also be a link between social D and health system D, and another between social D and env D? (Clair Hanson, IPCC TSU)	Figure is changed
E-8-179	A	10	0	10		Comment: Table 8.3 comment: in 3rd line of copy citation should be "8.2.7" not "8.2.6" (Kim Knowlton, Columbia University)	Table deleted
E-8-180	A	10	0	10		Comment: Table 8.3 comment: at top of p.10, 2nd line of copy under "Air quality and respiratory disorders" - section cited should be "8.2.6" not "8.2.5" (Kim Knowlton, Columbia University)	Table deleted
E-8-181	A	10	3			instead of "temperature-related" "thermal stress-related or heat- and cold-related" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	
E-8-182	A	10	6	10	6	It is not always the meteorological extreme event that is important but a run of events that leads to a health impact e.g. a run of much higher than average but perhaps not 'extreme' or record breaking night time minimum temperatures - high impact weather might be a better term? (Andrew Morse, University of Liverpool)	Not Addressed; we agree but there are no studies available
E-8-183	A	10	18	10	22	Since "some climatologists consider "very likely", etc, then, in line 22, page 10, instead of saying "can", it would be better to say "may". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-184	A	10	19	10	21	Change "Some climatologists now consider it "very likely" that human influences on global climate at least doubled the risk of a heat wave such as experienced in Europe in 2003" to "some climatologists now consider that human influence on	Addressed

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						global climate may have more than doubled the risk of a heat wave such as experienced in Europe in 2003". This proposed wording is consistent with WG I's assessment of this reference. (See Chapter 9, Pg. 84, line 37 of WG I's SOD). (Lenny Bernstein, L.S. Bernstein & Associate, L.L.C.)	
E-8-185	A	10	19	19	10	The statement "some climatologists now consider it "very likely" is attributed to a paper in Nature, but it would be fairer to say that "most climatologists are wary of attributing..." or "many climatologists question ..." and quote the multitude of publications that support this viewpoint. A glance at the bibliography of the paper, and of commentaries in other papers will confirm the very limited selection of references. THIS IS A CHARACTERISTIC OF MANY PUBLICATIONS THAT ARE CITED. PUBLICATIONS SHOULD INCLUDE A RIGOROUS SELECTION OF REFERENCES THAT CHALLENGE AS WELL AS SUPPORT THEIR CONTENT. THIS IS ESPECIALLY TRUE FOR REVIEWS. Moreover, we know that the current warming trend began long before any contribution by the burning of fossil fuels; clearly if the trends are upwards, the most recent years are the higher: if you walk up a staircase, the last steps are the highest. (Paul Reiter, Institut Pasteur)	Addressed
E-8-186	A	10	19			you state that some climatologists consider the 2003 heat wave very likely to be caused by CC. This isn't the majority view so you need to say so (Clair Hanson, IPCC TSU)	Addressed
E-8-187	A	10		10		Table 8.3 - Some of the links to chapters in the 4AR for the malaria section are incorrect. (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Table deleted
E-8-188	A	10		11		the heatwaves section is 3x longer than the cold wave section. Can anymore be said about cold waves to redress the balance? (Clair Hanson, IPCC TSU)	Addressed
E-8-189	A	11	8	11	11	If the proportion is unknown, it would not be possible to say what the determinants are with any accuracy. It is probably best to say that the proportion is variable (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-190	A	11	13	11	13	The use of the term frequent suggests these are not extreme events so the section relating to p10 ln 6 is inconsistent (Andrew Morse, University of Liverpool)	Addressed
E-8-191	A	11	13		21	I carry around a model of heat deaths that says poor countries are less vulnerable because their infrastructure does not try to block out the heat and is therefore less vulnerable to failure (say from power outages) that causes problems in Europe and U.S.). If this is true, a change to this paragraph would be needed. even if it is not	Not Addressed

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						true, if my model is in the literature it deserves to be refuted. (Alan Krupnick, Resources for the Future)	
E-8-192	A	11	15			are the 18 heatwaves in 19 years in India unusual or the norm? Please give an indication of the frequency before 1980 and after 1998 (Clair Hanson, IPCC TSU)	Not Addressed
E-8-193	A	11	25	11	34	This would be a place to note studies relating cold temperatures to increased incidence of cardiovascular morbidity and mortality. (Neville Nicholls, Monash University)	Addressed
E-8-194	A	11	25			Section 8.2.1.2 - in Russia there is little or no winter excess mortality while the UK has one of the highest winter excess mortality rates despite not having the coldest winters. The impact of cold weather on mortality depends on both the built environment and outdoor clothing (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-195	A	11	29	11	29	After heating system failures add "or highway 's blockage by sudden and intense snow storms" (Osvaldo Canziani, IPCC WGII Co-chair)	Partly Addressed
E-8-196	A	11	31	11	32	Source of this information? (Peter Berry, Health Canada)	Addressed
E-8-197	A	11	31	11	31	Cite evidence of decreases in extreme cold events - climate change has regional manifestations which do not all follow global trends. Also in warmer climate a current extreme cold event will not be the same as extreme cold event based on a new climate (Andrew Morse, University of Liverpool)	Addressed
E-8-198	A	11	36	11	51	Having worked with thermodynamic chambers with capacity to modify temperature, air circulation and humidity, it can be stated that the absolute humidity is a critical factor in human wellbeing. The combination of temperatures exceeding 30 °C with humidity above 65 % made people to faint with high heart pulse rates. Additional information is also available in the book Hot Climate, Man and his Heart, by Burch G.E and N.F. De Pasquale, which first edition is from 1962, by Charles C. Thomas-Publisher, Illinois). Chapter XI "The effect of thermal stress on normal and disease cardiovascular systems of man", includes interesting information on: cardiac output, work and powering subjects with normal and diseased hearts exposed to hot and humid environments (page 140). It is therefore suggested to include this important environmental variable – air humidity. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-199	A	11	36			instead of "Temperature-related" "Thermal stress-related or Heat- and cold-related" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed

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E-8-200	A	11	36			Hum, Europe is now better geared to prevent the massive death toll of 2003. Less cases should not give the impression that climate change is having less adverse impacts. As we are gathering data for evidence, some countries are already adapting. In order not to weaken our case we need data on the expenses incurred to manage the health impacts from heat waves!. (von Hildebrand, WHO)	
E-8-201	A	11	39	11	39	replace "effect modifiers" with another term that most people can understand (Peter Berry, Health Canada)	Addressed
E-8-202	A	11	41	11	43	Need to include "health response strategy" or "public health interventions" to this list. Again, important role of adaptation seems to be lost in your analysis. Many of these important city-level factors can be managed through strong public health interventions - this is how we seek to reduce vulnerability by building adaptive capacity. (Peter Berry, Health Canada)	Addressed
E-8-203	A	11	42	11	42	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples heat island. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-204	A	11	42	11	42	Comment: While Curriero et al. (2002) refer to income & proportion of elderly their paper does not address topography nor heat island magnitude (Kim Knowlton, Columbia University)	Addressed
E-8-205	A	11	43			instead of "temperature-mortality" "thermal stress mortality" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Not Addressed
E-8-206	A	11	50			instead of "temperature-mortality" "thermal stress mortality" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Not Addressed
E-8-207	A	11	51			instead of "temperature-attributable" "thermal stress attributable" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Not Addressed
E-8-208	A	12	1			Append the following to the end of the first sentence on this page: "and technologies continue to reduce the health impacts of current climate and climate variability (Goklany and Straja 2000)". (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-209	A	12	8	12	8	replace "reduced" with "declined" (Peter Berry, Health Canada)	Addressed
E-8-210	A	12	8			change "reduced" to "decreased" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-211	A	12	15	12	29	There is too much focus on recent disasters, as if that proves anything. We would like to see a multi-decadal focus that examines trends. See Goklany (2006b,	Addressed

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						2005b). (Indur Goklany, US Department of the Interior)	
E-8-212	A	12	15			Insert the following after the first sentence on line 15: “Despite the recent spate of deadly extreme weather events such as the 2003 European heat wave and the hurricanes of 2004 and 2005, data from EM-DAT, the International Disaster Database maintained by the Office of Foreign Disaster Aid and Center for Research on the Epidemiology of Disasters at the Université Catholique de Louvain, Brussels, Belgium, indicates that aggregate mortality and mortality rates due to extreme weather events are generally lower today than they used to be in earlier decades. Globally, mortality and mortality rates have declined by 95 percent or more since the 1920s. The largest improvements came from declines in mortality due to droughts and floods, which apparently were responsible for 95 percent of all deaths caused by extreme events during the 20th century. For windstorms, which contributed most of the remaining 5 percent of fatalities, mortality rates are also lower today but there are no clear trends for mortality. These declines suggest that adaptations have considerable potential.” References: Goklany (2006b, 2005b). (Indur Goklany, US Department of the Interior)	Addressed
E-8-213	A	12	17	12	17	Since the Earth’s warming is expanding the tornado’s area from low-middle latitudes to high-middle latitude regions, it suggested to associate the high wind not only to storms, squall-lines and cyclones but also with tornados. Therefore it is suggested to include the reference of the weather features leading to high wind conditions. In this regard, as well as in what concerns flood and inundation cases, cross reference to Regional Chapters is necessary. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-214	A	12	17	12	17	“(Venezuela in 1999) - What is this - an example of an event or an author? Suggest deleting or providing more information about this event. (Peter Berry, Health Canada)	Addressed
E-8-215	A	12	19	12	19	suggest replacing "mental health" with psycho-social impacts" or "impacts on mental health" (Peter Berry, Health Canada)	Not Addressed
E-8-216	A	12	21	12	21	Diseases are "transmittable" not "communicable" (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed, explained earlier why
E-8-217	A	12	21	12	21	A reference more specific to this issue could be the book: MSF (1997) 'Refugee health: an approach to emergency situations', Medecins Sans Frontieres/Macmillan, London. (Roger Few, University of East Anglia)	Addressed
E-8-	A	12	23			Add more data from the floods in China, July 2006	Addressed

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218						(von Hildebrand, WHO)	
E-8-219	A	12	23		24	1. the information of “in 2003, 150000 people were affected by floods in China” is wrong. the right information is that “in 2003, 130 million people were affected by floods in China(NCC/CMA, 2004)” Reference: National Climate Center, Chinese Meteorological Administration. 2004. China climate impact assessment in 2003. Beijing: Chinese Meteorological Press. 20p (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Addressed
E-8-220	A	12	26	26	12	It is misleading to state: "in the last two decades, major storm and flood disasters have occurred". This is certainly true, but the inference is that these events are something new and more serious. There have been far larger catastrophies throughout recorded history. Storms during the Little Ice Age completely changed the profile of islands and coastlines around the North Sea. In the terrible ENSO events at the end of the 19th century, at least 50 million people died from China to Australia to East Africa to Brazil. On September 8, 1900, Galveston was struck by a hurricane of such destructive force that it continues to be known as "the worst natural disaster in the nation's (USA) history". The "Great Hurricane" of 1780 killed 22,000 people on the islands of Martinique, St. Eustatius, and Barbados. In 1887, about 900,000 people died when China's Yellow River burst its banks in the worst-ever recorded flooding. The massive flooding of the Yangtze River in China in 1931 caused more than 3 million deaths from flooding and starvation. In 1938 and 1939 floods killed 1 million people in a two-year period in China. In July 1959, massive floods in China killed at least 2 million people. In November 1970, Bangladesh lost more than 300,000 people cyclone-induced flooding. These disasters dwarf those mentioned in the paragraph. (Paul Reiter, Institut Pasteur)	Addressed
E-8-221	A	12	27	12	29	"Although there is increasing evidence that" This sentence tends to downplay a very important adaptation success that has occurred over the last few decades. As I understand it, the reduction in deaths has been quite significant or stark. We need to acknowledge that we have made signfiicant strides in this regard, although more work is still needed. It should also be pointed out that this stat is referring to developed countries only, I believe. (Peter Berry, Health Canada)	Addressed
E-8-222	A	12	33	12	33	cite databases or sources (Andrew Morse, University of Liverpool)	Addressed
E-8-223	A	12	36			change 'surges in ...finds...' --> 'surges over the ...found...' (Clair Hanson, IPCC TSU)	Addressed

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E-8-224	A	12	45			Was there an increase in disease/deaths? This is a poor example to use here - the point above refers to low and middle income countries and the point below this statement indicates that the risk of infectious disease following flooding in high-income countries (e.g., USA) is generally low. If this is the case, why/how is the Katrina example relevant? If there were significant deaths/illnesses is this an aberration?? (Peter Berry, Health Canada)	Addressed
E-8-225	A	12	48	12	48	After the sad experience with the 2005 hurricanes in the USA, it would be better to replace "would be" instead of "is" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-226	A	12	48	13	2	There is too much focus on recent disasters, as if that proves anything. The real issue is whether these flood related incidences are now worse than they used to be and, if so, why. This text doesn't deal with this critical issue. [By the way, we would recommend noting lack of information on this topic, if that is indeed the case, and adding that to a list of research ideas.] We would like to see a long term (i.e., multi-decadal and longer-term) focus. That is the appropriate context in which recent climate changes -- and their effects -- must be viewed. (Indur Goklany, US Department of the Interior)	Addressed
E-8-227	A	12	50			I can get more on publications related to flood related increases in diarrhoel diseases. Need them? (von Hildebrand, WHO)	Addressed
E-8-228	A	13	4	13	14	Please re-write this paragraph as it is poorly written at present (Andrew Morse, University of Liverpool)	Addressed
E-8-229	A	13	7			p13 line 7 it would be worth verifying that the 'safe concentrations' referred to were short term and not long term acceptable exposures. Applying the latter in place of the former would normally lead to a conclusion that a situation was more dangerous than was in fact the case (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-230	A	13	10			a --> the (Clair Hanson, IPCC TSU)	Addressed
E-8-231	A	13	15			Although tsunamis are not related with our topic, lessons can be learned in terns/ms of impacts and as\adaptive measures taken by flood affected populations living in low-lying areas. I could get a box on this. (von Hildebrand, WHO)	Addressed
E-8-232	A	13	19			"under investigated" What does this refer to? Research conducted? Monitoring of health impacts after events? (Peter Berry, Health Canada)	Addressed

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E-8-233	A	13	27	13	29	I prefer the definition of vulnerability that suggests it is a function of (1) sensitivity (2) exposure to hazard (3) capacity to adapt. "Attributes of the person at risk" is too broad and vague to really understand how vulnerability might differ among populations and individuals and how it may change. For example, does "where they live" relate to exposure or capacity (e.g., living in a poor area with few services)? Age is usually important because it increases physiological sensitivity to specific impacts, while income increases adaptive capacity. Definition provided here also does not include the magnitude of the hazard. Key point to include is that some hazards may simply be so big that they overwhelm communities even if they have very high capacity to adapt. Also, suggest providing a definition of vulnerability earlier in the chapter as some of the analysis before this page speaks to key issues related to vulnerability. (Peter Berry, Health Canada)	Addressed
E-8-234	A	13	27		34	should be moved up the section to become the second paragraph of 8.2.2 (Clair Hanson, IPCC TSU)	Addressed
E-8-235	A	13	39	13	40	The last sentence on this page is not valid as a blanket statement. If one is talking about areas that are, for instance, low lying or eroded (due to the action of the sea) this might be accurate. But it would not be valid if the area is degraded because of, say, air pollution. (Indur Goklany, US Department of the Interior)	Addressed
E-8-236	A	13	44	14	12	The Box 8.1 is interesting, the pity is that the "tsunami" is not a climate change or even climate event. It is a telluric one, a seism under the sea. Since it is a generalized confusion about these and the climate change events, it could be added that the increasing sea level rise, due to the Earth's warming tends to exacerbate the inundation effects. This short addition would clarify the issue and give some climate change implication to these geological phenomena. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-237	A	13				Box 8.1 - the 2004 tsunami was not climate related. Can you provide an alternative climate-related example? (Clair Hanson, IPCC TSU)	Addressed
E-8-238	A	14	16	14	37	Nutrition: Again: to point to a balanced global food production impact is correct; the key is in the distribution of the food. Even given the best political will, it would present an unprecedented logistical effort to feed hundreds of millions of people in the Southern half of the globe with food production surpluses in the north. Migration and destabilization, and certainly micro- and macronutrient malnutrition, if not famine are the likely companions of such imbalances. This should be addressed very clearly in the text. Again one hand on a hot plate and the other one	Addressed

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						in the fridge do not mean “comfortable average temperature”. Given its potentially large health impact of CC on (mal-)nutrition which is also conveyed in Fig. 8.3, considering that the causal chain through which CC influences human nutrition meanders through different pathways (regional water scarcity, salination of agricultural lands through seawater flooding, destruction of crops through freshwater flooding, disruption of food logistics through disasters, increased burden of infectious diseases etc.) it may be desirable to bring all this together in a box. Admittedly all is said somewhere in the IPCC AR, but few readers go through all chapters and since this is an eminent health problem, malnutrition deserves a synoptic treatment in chapter 8. (Rainer Sauerborn, Heidelberg University)	
E-8-239	A	14	16			There is nothing in Section 8.2.3 that addresses food security, despite the title. Also nutrition is covered very scantily. (Indur Goklany, US Department of the Interior)	Addressed
E-8-240	A	14	18	14	18	It might be worth saying there are many definitions of drought but it can be defined as ... (Andrew Morse, University of Liverpool)	Addressed
E-8-241	A	14	21			After the period (full stop) on line 21, insert the following: "According to EM-DAT, drought was responsible for 55% of aggregate worldwide deaths due to all extreme weather events between 1900 and 2004. Comparing annually averaged deaths and death rates from 1900-1989 and 1990-2004, indicates that both declined by 99.9 % (Goklany 2006b). The remarkable drop in annual drought fatalities indicates that, for whatever reason, available food supplies per capita have increased in marginal areas, possibly due to greater food production at the global level and an enhanced ability to move food from food surpluses areas to deficit areas through institutions such as international trade and governmental and nongovernmental aid agencies and philanthropies (e.g., through the World Food Program or the International Red Cross) facilitated by better transportation and communication networks, and irrigation facilities (Goklany 1998)." (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-242	A	14	23			please provide section numbers when referring to other chapters, here and throughout the remainder of this chapter. (Clair Hanson, IPCC TSU)	Addressed
E-8-243	A	14	25	14	25	Droughts also affect the water quality, due to pathogenic and other pollutant concentration: therefore, it would be appropriate to mention that. One way would be: “Water scarcity and the associated pollution problems as well as the water-washed, etc”.	Addressed

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						(Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-244	A	14	25			Define "water-washed" diseases (Peter Berry, Health Canada)	Addressed
E-8-245	A	14	27			page 14 line 27 surely both acquiring and dying from ... (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-246	A	14	29	14	31	I don't understand this sentence (Peter Berry, Health Canada)	
E-8-247	A	14	33			Farmer suicides in India have increased enormously, due to poor yields and debts. I can get a reference on publications on this. (von Hildebrand, WHO)	Addressed
E-8-248	A	14				Box 8.2 should be moved to section 8.2.3.1 (Clair Hanson, IPCC TSU)	Addressed
E-8-249	A	14				8.2.3 should be entitled 'Drought' followed by 2 sub-sections 8.2.3.1: Nutrition and food security, and 8.2.3.2: Infectious disease (Clair Hanson, IPCC TSU)	Addressed
E-8-250	A	15	1			Box 8.2: Synergies: Droughts may contribute to locust plagues, depleting stores and creating pre-conditions for famines during subsequent years of drought. (Paul Epstein, Harvard Medical School)	Not Addressed
E-8-251	A	15	2			Add a new sentence at the end of the para that reads as follows: "On the other hand, globalization (through trade, aid, technological transfer and diffusion) has helped substantially diminish the effects of drought on mortality (Goklany 1998, 2006b)." (Indur Goklany, US Department of the Interior)	Partly Addressed
E-8-252	A	15	7			Google search on "Drought and Amazon basin" gave hundreds of hits. One of them, at http://pubs.wri.org/pubs_content_text.cfm?ContentID=3968 was the following Source: 2006. Climate science 2005: Major new discoveries. Kelly Levin and Jonathan Pershing. A study conducted in 2005 by the Amazon Environmental Research Institute suggests that the extreme drought characterizing the Amazon Basin may have been driven by Atlantic Ocean surface warming and resultant air circulation changes. Researchers at a forest monitoring station run by the Woods Hole Research Center also state that rising sea surface temperatures in the North Atlantic could be responsible for the record drought. Amazon Environmental Research Institute. "Amazon Basin experiencing extreme drought." 19 October 2005 at forests.org/articles/reader.asp?linkid=47478 Hopkin, Michael. "Amazon Hit by Worst Drought for 40 Years: Warming Atlantic Linked to Both US Hurricanes and Rainforest Drought." Nature News. 11 October 2005 at www.nature.com	Addressed; but all these references mainly refer to the meteorological part of the event; contradictory media information is only available for health impacts

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						Warming sea surface temperatures create both low-pressure and high-pressure storm systems over the Atlantic. The low-pressure systems are characteristic of the North Atlantic and bring increased precipitation to nearby regions. The high-pressure systems, however, hold less rainwater and concentrate over the South Atlantic, leading to lower precipitation levels in regions like the Amazon. The current drought is considered the most severe in the last half century and has brought devastation to many local communities and ecosystems in the Amazon. Implications: Increasing greenhouse gas concentrations and resulting global temperature increases may lead to even more pronounced and lengthy periods of drought in the Amazon. Not only will the Amazon's ecosystem services, population and biodiversity be negatively impacted, but the rainforest's capacity to sequester carbon may also be compromised. (von Hildebrand, WHO)	
E-8-253	A	15	7			Box 8.3. How does this compare with past drought episodes? The real issue is whether drought, and its consequences, are now worse than they used to be and, if so, why. This text doesn't deal with these critical issues. [By the way, we would recommend noting lack of information on this topic, if that is indeed the case, and adding that to a list of research ideas.] We would like to see long term trends, so we know we are not dealing with an anecdote. (Indur Goklany, US Department of the Interior)	Not Addressed, this session does address sensitivity
E-8-254	A	15	7			Box 8.3 – based on only one reference. Is this about climate variability or climate change? (Paul van der Linden, Met Office)	Addressed
E-8-255	A	15	14	15	14	\$100,000 seems small - is this correct? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed – deleted
E-8-256	A	15	14			"\$100 000" Is this figure correct? Also, last sentence in this paragraph is awkward and should be reworded. (Peter Berry, Health Canada)	Addressed
E-8-257	A	15	18	15	19	The statement 'traditional resource-dependent communities are not prepared to cope with extremes (World Bank, 2005)' is way too generalized. On the contrary, it is likely in many cases that traditional communities have long-standing coping mechanisms to extremes - whether those coping mechanisms remain viable in conditions of economic and environmental change will vary greatly according to context. (Roger Few, University of East Anglia)	Addressed
E-8-258	A	15	24	15	24	An enhanced burden of VBDs may also be conveyed through changes in disease transmission intensity and severity of disease where diseases are already endemic. I	Addressed

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						agree that we do not have enough evidence to assert this with confidence but that may be our weakness in research methods, funding or interest, rather than an absence of effect. What about the case of increases of BoD due to meningococcal meningitis (pg 15)? This is an increase in infectious disease (non VBD). (Rainer Sauerborn, Heidelberg University)	
E-8-259	A	15	25	15	47	As before, cross reference with the Regional Chapters may bring other regions information. Such is the case of the Venezuelan encephalitis and the Nile Fever, exacerbated by droughts. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-260	A	15	33	15	35	This sentence is unclear. In what way has distribution of meningitis changed? Increase or decrease? (Peter Berry, Health Canada)	Addressed
E-8-261	A	15	37	15	37	"Some mosquito-borne diseases that have reservoir hosts show strong drought/non-drought temporal relationships". What is meant by "reservoir hosts" and strong drought/non-drought temporal relationships? The sentence is obscure. (Paul Reiter, Institut Pasteur)	Addressed
E-8-262	A	15	38	15	38	As emphasized in my review of the first draft, drought periods often INCREASE transmission. The example I gave was the great malaria epidemic in Sri Lanka (Ceylon) in which 124,000 people died. The phenomenon is one of the basics of malaria epidemiology. Again, drought has been associated with outbreaks of Culex-borne viral diseases because drainage canals and small rivers become stagnant. In a Yellow Fever outbreak in Kenya in 1992-93, we hypothesized that drought had drawn wild primates and humans to the same sites for water, giving rises to human infections. etc. etc. (Paul Reiter, Institut Pasteur)	Addressed
E-8-263	A	15	38		39	please reword/rephrase 'population of non-immune reservoir hosts builds up' (Clair Hanson, IPCC TSU)	Addressed
E-8-264	A	15	41			also may --> may also (Clair Hanson, IPCC TSU)	Addressed
E-8-265	A	15	42			Box 8.2 doesn't mention malaria - focusses on food availability (Clair Hanson, IPCC TSU)	Addressed
E-8-266	A	15				Box 8.3 is not referred to in the text (Clair Hanson, IPCC TSU)	Addressed
E-8-267	A	16	1			I believe more to be said on food safety and climate change. I will look for publications here. (von Hildebrand, WHO)	Addressed
E-8-	A	16	5	16	6	replace "for each degree increase in weekly" with "with"	Addressed

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268						(Danny Harvey, Dept of Geography, University of Toronto)	
E-8-269	A	16	13	16	13	As mentioned before, ciguatera id s a local designation for the Antilles and Caribbean sea; similar poisoning effects are registered in other regions, probably under other s designations. This should be clarified: As mentioned before, algae blooming producing what is called "marea roja"(red tide), in the South Atlantic Basin brings shellfish and fish poisoning. These situations bring the public health authorities to forbid fishing under such conditions. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-270	A	16	15	16	15	some types of shellfish poisoning are not related to warmer seas (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-271	A	16	19	17	37	It is necessary introduce a reference to naturally poisoned water, like it happens with some metals, i.e. Arsenic and Fluoride. Climate change, either directly, by modifying the underground water replenishment conditions or, indirectly, through higher water requirements due to increasing temperatures . Fluorosis and Arseniosis affect more than 200 million people with serious diseases and loss of immunological defenses, in all regions of the world. Under this same section, the soil and plants washing down their agrochemicals ´accumulation, would call for a comment, like it is the serious contamination of water in the areas where coca and their derivate drugs are produced.. (Osvaldo Canziani, IPCC WGII Co-chair)	We agree but how far is this climate change related? Please explain
E-8-272	A	16	21	16	51	The low weight allocated to the impact on diarrheal diseases (Fig. 8.3.) through any of the four pathways described on page 16 is not reflected in the graph and should be added, in my view. (Rainer Sauerborn, Heidelberg University)	Addressed
E-8-273	A	16	23	17	39	Section 8.2.5 : This section does not reflect results of many studies on climate change impact on cynobacteria and associated health impacts. For example see Weyhenmeyer 2001 Ambio 30(8):565-71, Paerl 2003 Ambio 32(2): 87-90, Arheimer 2005 Ambio 34(7): 559-66 and many other. (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Addressed
E-8-274	A	16	24	16	24	The sentence starting on this line should include also ground water as affected by climate change, very particularly in shallow phreatic levels (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-275	A	16	25			What is "improved water"? (Peter Berry, Health Canada)	Addressed
E-8-276	A	16	27	16	37	There is at least one more "main consideration". The fifth consideration is the availability of health services, and oral rehydration therapy, among other things. Accordingly, the text (on line 27) should be modified, and a new bullet added on	Not addressed, because we are talkiing about the links between climate variability, change and water and health

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						line 37. (Indur Goklany, US Department of the Interior)	
E-8-277	A	16	30	16	30	It would be more correct to read “The role of precipitation extremes - either intense rainfall or drought –“ (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-278	A	16	35	16	35	Add other important elements through the inclusion of an additional bullet saying *Side effects of flood and inundation, like dispersion of sewage materials and the formation of mold /mildew. as well as persistent high air and soil humidity, bringing ill health conditions, would be more critical in costal and riparian areas, due the Earth ´s warming. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-279	A	16	49			p16 line 49 - 50 the relevance of "open ... animals" to the climate change debate is unclear Note in this section most reference is to impacts of flooding/runoff, little to the physical and managerial stresses on water supply systems that are known to arise from drought and impacts arising from them. (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-280	A	16	49			for --> from (Clair Hanson, IPCC TSU)	Addressed
E-8-281	A	17	4	17	5	"Climate change is associated with more...." Should this not be "Climate change is expected to result in more...."? Or, is the point bing made that an association has been found between current climate variability and more extreme rainfall events in temperate regions - I think it is the first point that you are trying to make, but could be wrong. (Peter Berry, Health Canada)	Addressed
E-8-282	A	17	15			"There is stronger evidence" - then when? What? Not clear. (Peter Berry, Health Canada)	Addressed
E-8-283	A	17	22	17	31	there may be an association between cholera and algal blooms which would be a mechanism for the links with temperature (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-284	A	17	22	17	24	Page 17: Lines 22-24: the statement that the bimodal seasonal pattern of cholera follows sea surface temperature is not correct. The paper by Bouma and Pascual shows that there is an association for the first peak in the spring. The second peak is less well understood. In fact, the figure in Colwell (1996) shows that there are two peaks in temperature and in cholera (for one year); the spring peak in cholera follows that of temperature but the relationship to the second peak is much less clear. Cholera rises when temperature is already decreasing.	Addressed

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						(Xavier Rodó, Univ. of Barcelona)	
E-8-285	A	17	22			p17 line 22 et seq. More caution in the statement regarding the role of marine plankton in seasonal cholera would be appropriate (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-286	A	17	24			Page 17: Line 24: "Interannual variability was ..." . Other references are appropriate here, namely Pascual et al (Science, 2000) and Koelle et al. (2005). Same paragraph: The whole emphasis is on SSTs, presumably in the Bay of Bengal. The association with ENSO, that is SSTs in the Pacific, should be mentioned too, as most of the papers cited are focused on ENSO and show a clear influence on cholera. The regional mechanisms mediating the effect of ENSO is under investigation. But recent results point to the importance of rainfall and related variables such as flooding and river discharge (Koelle et al. 2005). There is no reason to focus the whole paragraph exclusively on SSTs in the Bay of Bengal. (Xavier Rodó, Univ. of Barcelona)	Addressed
E-8-287	A	17	33	17	34	The message from this paragraph is unclear, particularly with respect to the expect impacts of climate change. (Peter Berry, Health Canada)	Addressed
E-8-288	A	17	34			p17 line 34 - 35 use of Salmonella as an example of an environmentally persistent pathogen appears an odd choice given the availability of, for example, Cryptosporidium (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-289	A	17	40	18	12	Under this section there is no reference on the hydrocarbon emissions by certain plants and trees. The acacia trees planted along the streets in many cities (i.e. Geneva, La Plata), are heavy producers of aromatic hydrocarbons and terpenes, alike the pine trees. These emissions are impacting with asthma and allergic-prone conditions. Also these plant hydrocarbons enhance the surface ozone production. (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed
E-8-290	A	17	44			meso-time-scale (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-291	A	17	47	17	47	Are you defining a difference between an anticyclone and a high-pressure system - perhaps something to do with circulation patterns? If so this needs to be said more clearly. (Andrew Morse, University of Liverpool)	Addressed
E-8-292	A	17	47			should read "systems that reduce" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-293	A	17	51	17	52	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of	Addressed

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						repetition. Some examples heat island. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	
E-8-294	A	18	1	18	1	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples heat island. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-295	A	18	5			What is an "inhalation injury"? (Peter Berry, Health Canada)	Addressed
E-8-296	A	18	12			Add the following at the end of the paragraph: "On the other hand, more frequent rain may reduce the concentration of certain pollutants." (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-297	A	18	14	18	31	This sections would deserve one or two lines reference on preventive measures, monitoring and reporting of high surface ozone concentrations in heavily populated settlements (Osvaldo Canziani, IPCC WGII Co-chair)	Partly Addressed
E-8-298	A	18	16	18	16	You may need to address the delay in ozone production as rural concentrations can exceed those in cities (Andrew Morse, University of Liverpool)	Partly Addressed
E-8-299	A	18	23	18	23	Here again, the lack of reference on the Regional Chapters may induce the idea that surface ozone is only increasing its concentration in some countries when, as a matter of facts, it is increasing everywhere. As shown in the WMO Special Environmental Reports, this type of pollution is well-known from the mid-1950. The modern trend of internal combustion vehicles has shown increasing concentrations along highways, urban areas with dense traffic (i.e. Mexico City, Santiago de Chile, Los Angeles, etc). Therefore, cross references are necessary. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-300	A	18	25			change "are" to "is" [the subject is "exposure"] (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-301	A	18	33			What about the Asian Brown Cloud? And also its potential effects to actually LOWER temperatures at ground level? (von Hildebrand, WHO)	Addressed
E-8-302	A	18	35	18	35	After air pollutants add "in general and, in particular of fine particulate matter, etc" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-303	A	18	35		47	This discussion is not very satisfying. What are the precise links of weather to PM concentrations, where PM is arguably the greatest conventional pollutant threat to health? Ammonia may be part of this story. I have a model where PM concentrations are highest in colder weather. More is needed here.	Partly Addressed

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						(Alan Krupnick, Resources for the Future)	
E-8-304	A	18	39	18	39	Energy use needs seperating as it is not a function of atmospheric dynamics but a human response to those dynamics (Andrew Morse, University of Liverpool)	Addressed
E-8-305	A	18	39	18	39	After “energy use” add “In urban areas, engine fuelled vehicles or internal combustion transportation emissions are the main surface ozone producing system. Increased traffic along highways affect people and vegetation in the neighborhood. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-306	A	18	46	18	46	It is not the climate but the prevalent weather or meteorological conditions which, under specific solar radiation circumstances, mainly availability of appropriate UV radiation, which brings the photochemical reactions leading to surface ozone formation. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed in 8.2.10
E-8-307	A	19	4	19	5	This phrase looks rather inconclusive. In fact, having not local pollution sources there would be no long-range, trans=boundary pollutant transportation.. It it the suggested to add, at least, the two main factors, i.e. industrial areas and forest fire sources. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-308	A	19	4	19	4	The link to desertification is not clear - as a particle source, yes, but is more being suggested here? (Andrew Morse, University of Liverpool)	Addressed
E-8-309	A	19	14	19	21	Section needs redrafting e.g. will non air pollution experts understand PM2.5 to PM10 as coarse? (Andrew Morse, University of Liverpool)	Addressed
E-8-310	A	19	14	19	14	Once again, regional cross-cutting is suggested, there are well known sand-storms in the coastal deserts in west South America, in the Patagonia. Dust devils are also very common in many countries in Latin America, with implications on human health (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed, lack of literature
E-8-311	A	19	14		21	This section ignores very long range transport, e.g., between china and the U.S., which has been shown to be surprisingly large. Certainly, international transport is a major factor for neighboring countries (Japan being affected by China) (Alan Krupnick, Resources for the Future)	Addressed
E-8-312	A	19	16	19	16	PM2.5 - PM10 should be explained. Also PM2.5 are not considered as coarse particulates (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-	A	19	24	19	39	8.2.7. Aeroallergens. I suggest to fold this small chapter under 8.2.6. Regarding	Addressed

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313						the pattern of argument very often encountered in this report, the chapter reads a bit lik: ...this may be the case and that as well, evidence is weak, nothing can be said with certainty, end of chapter, no reference to efforts required. No attempt is made to weigh the evidence and make judgment about potential health risks. The otherwise laudable aim to only state facts that are scientifically solid leads to a "bias to the null" in the report. (Rainer Sauerborn, Heidelberg University)	
E-8-314	A	19	26	19	27	This phrase shall also reflect the allergenic importance of plants terpenes, as mentioned above. Therefore, the phrase should read "Several studies report evidence for climate change effects not only on the timing and duration of pollen and hydrocarbon emission ´s season, but also the pollen amount and hydrocarbon concentrations. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed partly
E-8-315	A	19	26		39	I would urge the writers of this section to comb the Japanese literature on allergens. The Japanese really struggle with allergens from trees and grasses and I have the impression things are getting worse. (Alan Krupnick, Resources for the Future)	Addressed, where articles found
E-8-316	A	19	39	72		P19/72 8.2.7 Line 39: There are synergies: aeroallergens (pollen and mould spores) attach to diesel particles, the combined particles/aeroallergens are delivered deep into the respiratory passageways and irritating nitrates within the diesel particles sensitize the immune cells and increase the allergic reaction. Other synergies: Early arrival of spring and late persistence of fall can increase the spring tree pollen induced and fall weed pollen-induced allergies. (Paul Epstein, Harvard Medical School)	Not Addressed
E-8-317	A	19	44	19	45	Include sand flies (Andrew Githeko, Kenya Medical Research Institute)	Addressed
E-8-318	A	19	45	19	45	What are the 'flies' that are mentioned? I asked this before. Mosquitoes, Blackflies, Sandflies are techically flies. "Flies" in the common usage sense are Musca domestica and related species, which do not bite and are of disputed relevance as vectors. (Paul Reiter, Institut Pasteur)	Addressed
E-8-319	A	19	45	19	46	"VBDs are among the most important health outcomes to be associated with climate changes due to their widespread occurrence and sensitivity to climatic factors". As in the first draft (though much improved) the language of this draft is often obscure. In what way is a VBD a "health outcome" and how can we associate this with climate change if, as already stated in earlier pages, we don't yet have clear evidence of such an association.	Addressed

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						(Paul Reiter, Institut Pasteur)	
E-8-320	A	20	1	20	25	Figure 8.2 and associated description are useful in illustrating the complexities involved in analysing the effects of climate on vector-borne disease. The authors should "community level factors" (e.g. herd immunity) to the diagram to more comprehensively illustrate the complexities involved. (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	
E-8-321	A	20	18			infection rate is repeated (Clair Hanson, IPCC TSU)	Addressed
E-8-322	A	20	19	20	20	There are two very good new references on this by Afrane et al 2005 and 2006. They have shown the effects of microclimate change on biting behaviour and vector capacity in Western Kenya Highlands (Andrew Githeko, Kenya Medical Research Institute)	Addressed
E-8-323	A	20	27	20	38	This is an example of the sort of writing that plagued the first draft. The ending "other explanations cannot be ruled out" is not the view favoured by specialists in tick-borne infections. On the contrary, they make it absolutely clear that changes in vegetation, wildlife and human behaviour are the major "explanations". Perhaps the best example is Lyme disease in North America. The prevalence of ticks, deer, and white-footed mice has been rocketing since the reforestation of vast areas of the north-eastern states of the US. The same is true for those parts of Europe where prevalence of TBE is increasing. But the picture is not clear, and indeed the southern limits of the disease may be moving northwards. As for West Nile virus, the European community is spending €1.4 million on research on these topics (EDEN project) precisely because the factors that affect transmission dynamics are unknown (incidence of WNV appears to be low in Europe, and only drew attention after the virus was exported to the New World. See remarks for page 28. (Paul Reiter, Institut Pasteur)	Addressed
E-8-324	A	20	33	20	33	VBD, robo and other IDs. pg 20, line 33. The question cannot be to attribute increases of any diseases ONLY to climate change. Framing the question thus would invariably produce a negative answer. (Rainer Sauerborn, Heidelberg University)	Addressed
E-8-325	A	20	40	20	42	The Pascual paper in PNAS suggests that earlier negative reports may have been statistically flawed (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-326	A	20	40	20	44	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples malaria. The same remarks are true for diarrhea, etc	Addressed

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						(Yola Verhasselt, Royal Academy of Overseas Services)	
E-8-327	A	20	40	20	44	Some authors have shown that malaria spreading / dissemination as well as the increased temperature effect on plasmodia reproduction are dependent from climate change. Therefore, it will be wise to check this question for the TOD, The issue remarked in the second phrase, in this paragraph, is very important. The reiterate pledge for data and allied socio-economic information shows that this is the main failure when interlinking climate change to human health issues. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-328	A	20	40	20	44	Lines 40-44: How can we approach the web of association by saying: “The attribution of change in human diseases must FIRST take into account ...i.e. exclude or deal with any non-climatic causes for changes in human diseases and THEN, in the residual so-to-say, look for effects due to cc. Our approach should be to take into account all factors in appropriate models with equal care and simultaneously. (Rainer Sauerborn, Heidelberg University)	Addressed
E-8-329	A	20	40	20	44	Chen et al 2006 have published new records of malaria vectors on the slopes of Mt Kenya. This is the first time vector have been reported in the area. Afrane, Yaw et al (2005) Journal of Medical Entomology 42: 974-980 Afrane, Yaw et al (2006) Am J Trop Med Hyg. 74: 772-778. Chen H, et al (2006) Malaria Journal 5:17 (Andrew Githeko, Kenya Medical Research Institute)	Addressed
E-8-330	A	20	40			this sentence seems to be categorical and contradicts the paragraph starting in page 22, line 5 (von Hildebrand, WHO)	Addressed
E-8-331	A	20				Figure 8.2 Is not clear the pathways need processes adding to them too. (Andrew Morse, University of Liverpool)	Addressed
E-8-332	A	21	1	21	3	Leishmaniasis certainly affects humans! The disease is endemic in southern Europe, but there is no evidence of northward movement . Neither is there evidence that the climate of the Mediterranean has moved (yet?) to Germany) where a dog infection has been documented and seized upon by climate change activists. I need to look up the distribution of phlebotomines in Germany; I am not sure if that much is known about them, nor of their competence for Leishmaniasis. (Paul Reiter, Institut Pasteur)	Addressed
E-8-333	A	21	11	21	12	As a specialist in West Nile virus, both in North America and in Europe (and co-ordinator of the EDEN West Nile sub-project) I can assure the authors that we have no persuasive evidence of such a relationship, unless it be climatic factors in the tropics that affect the incidence of infection in birds carrying the virus to the	Addressed

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						northern hemisphere. (Paul Reiter, Institut Pasteur)	
E-8-334	A	21	12	21	12	Nile need Virus adding i.e. West Nile Virus (Andrew Morse, University of Liverpool)	Addressed
E-8-335	A	21	21	21	28	I suggest the authors take time to read the literature on dengue written by those who study the disease. They will find none of the articles cited are by persons working in the field of dengue. There may well be some climate/weather association but it is obscure. In Puerto Rico, where I worked on dengue for 14 years, we had dry years and wet years and hot years and cold years. We could not tease out any relationship between incidence and these factors, despite having the longest system of continuous dengue monitoring in the world (the other is in Bangkok, where the same applies). Herd immunity is the principal determinant of dengue outbreaks in dengue endemic areas. Introduction of the virus by travellers is the principal determinant in areas (small islands) where transmission does not persist. I urge the authors to read my heavily referenced review of the subject in Environmental Health Perspectives (Reiter, P. 2001. Climate change and mosquito-borne disease. Environ Health Perspect, 109, Supplement 1:141-161). They will see a histogram of monthly dengue incidence that clearly demonstrates this. Incidentally, without wishing to be immodest, I see no reason why there is no reference to this review. After all, it was published in 2001.... and there are 189 references to climate/vector-borne disease. (Paul Reiter, Institut Pasteur)	Addressed
E-8-336	A	21	27			seems to make more sense to say "because EFFORTS AT water storage increase" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-337	A	21	27			insert 'of' after 'because' (Clair Hanson, IPCC TSU)	Addressed
E-8-338	A	21	30	21	30	The up-grading of Stegomyia to a full genus is a matter of debate, or rather, is resisted by many entomologists. If the authors wish to use the new nomenclature, they should mention that the mosquito is referred to as Ae. aegypti in most of the literature to date. In addition, they need to correct Ae. albopictus to Stegomyia albopicta because Stegomyia is feminine. (line 34). (Paul Reiter, Institut Pasteur)	Addressed, was requested by earlier reviewers
E-8-339	A	21	30	21	30	Dengue is now common in mid-latitude areas, like the Great Buenos Aires region. It has been observed that the air humidity plays a role in the dengue dissemination. Therefore, this meteorological variable needs to be referred to. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-	A	21	33	21	36	At present, the northern-most infestations of Ae. albopictus in the Americas is	Addressed

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340						about Indianapolis, exactly the latitude I suggested when I first discovered the species and its mode of introduction (Reiter, P. and Darsie, R. F. 1984. <i>Aedes albopictus</i> in Memphis, Tennessee (USA): an achievement of modern transportation? <i>Mosquito News</i> , 44:396-399; Reiter, P. and Sprenger, D. 1987. The used tire trade: a mechanism for the worldwide dispersal of container breeding mosquitoes. <i>J. Am. Mosq. Control Assoc.</i> , 3:494-501). To date, there is no evidence of its role as a vector, although WNV has been isolated from wild-caught females. (Incidentally, there is little reason to believe that it will not extend its range northwards in Europe, at least as far as Denmark). In the tropics it is generally considered as a "secondary vector" although recent epidemics in the Indian ocean challenge this viewpoint (Reiter, Fontenille and Paupy, <i>The Lancet</i> , in press). If you care to quote this, PLEASE don't attribute this to climate change! The current pandemic of Chikungunya is raging from La Réunion and Mauritius to India to Malaysia... (Paul Reiter, Institut Pasteur)	
E-8-341	A	21	39	22	40	Regarding malaria, it may be useful to mention the work by Martin P.H. and M.G. Lefevre " Malaria and Climate Sensitivity", published in <i>Ambio</i> , VOL 14, N ^a 4, 1995, informing on the modeled malaria potential annual transmission in the world, based on UKMO models. (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed, preTAR
E-8-342	A	21	39	22	40	8.2.8.2 Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples malaria. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-343	A	21	50	22	1	A systematic review is mentioned but two references are quoted. The article by Poveda et al is specifically about Colombia and not a systematic review. Kovats et al 2003 b is the systematic review (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-344	A	22	1	22	3	I found this sentence confusing. Presumably the trends that should be removed are those that are clearly not related to climate such as changes in vector control programmes etc? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-345	A	22	5	22	19	Patz's commentary presents no evidence to support his view. Pascual's article is based on a model that is based on the assumption that higher temperatures produce 2 logs more anopheline vectors. He presents no biological evidence to support this assumption. CAREFUL ATTENTION TO THIS ARTICLE, AND MANY OF	Addressed

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						THE REVIEWS ON THE CLIMATE CHANGE ISSUE, REVEALS THAT MOST DO NOT CITE OPPOSING VIEWS, OR CITE THEM WITHOUT EMPHASIS OR REFERENCE. A CLASSIC OF THIS KIND IS QUOTED IN THE TEXT OF THE COMMENTARY TO PASCUAL'S ARTICLE, PUBLISHED BY PATZ A FEW WEEKS EARLIER, BACKED UP BY A PRESS RELEASE: "Those who argue that we need not worry about small shifts in temperature should pause after considering the findings of Pascual et al.that a mere half-degree centigrade increase in temperature trend can translate into a 30–100% increase in mosquito abundance, in other words "biological amplification" of temperature effects". Patz gives no reference to who "those" are, nor, I am told, did he mention "them" in his press conference. The same group of malaria specialists who appealed for accuracy in this field started another protest at this mis-use of science, but we gave up. We simply cannot respond to every instance of this kind. (Paul Reiter, Institut Pasteur)	
E-8-346	A	22	6		10	these two sentences pretty much say the same thing. Please rephrase (Clair Hanson, IPCC TSU)	Addressed
E-8-347	A	22	6			Page 22: Line 6: "Analyses of time series ... indicate that ..". I suggest using the past tense "indicated" given the recent revision of these results showing that they do not hold (See Pascual et al. 2006). (Xavier Rodó, Univ. of Barcelona)	Addressed
E-8-348	A	22	12			Line 12: " because it might have resulted from inappropriate use of climate data sets". The reference here to Pascual et al. (2006) here is not appropriate. That paper does not criticize the use of those data, it revisits the statistical analysis of the data. write instead "because it might have resulted from inappropriate use of climate data (Patz et al, 2006) or from problems with the analysis of the data (Pascual et al.2006). (Xavier Rodó, Univ. of Barcelona)	Addressed
E-8-349	A	22	14			remove (Hay et al --> Hay et al (2002b) (Clair Hanson, IPCC TSU)	Addressed
E-8-350	A	22	19			Append to the end of the last sentenmce, the following: "as was the cessation of DDT use for indoor residual spraying (Barnes et al. 2005, Duffy and Mutabingwa 2005)" Reference: (1) Karen I. Barnes, David N. Durrheim, et al. 2005. Effect of Artemether-Lumefantrine Policy and Improved Vector Control on Malaria Burden in KwaZulu–Natal, South Africa. PLoS Medicine DOI 10.1371/journal.pmed.0020330. [2] Patrick E. Duffy and, Theonest K. Mutabingwa. 2005. Rolling Back a Malaria Epidemic in South Africa. PloS	Not Addressed

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						Medicine. DOI: 10.1371/journal.pmed.0020368. (Indur Goklany, US Department of the Interior)	
E-8-351	A	22	21	22	33	In the context of the debate on the African highlands, it is surely time to point out that the AREA INVOLVED IS MINISCULE COMPARED TO REGIONS IN SUB-SAHARAN AFRICA AT LOWER ALTITUDE WHERE MALARIA IS STABLE AND A TRAGIC SCOURGE OF THE POPULATION. THE TOTAL AREA ABOVE 2000M IN ALL OF AFRICA IS APPROXIMATELY 315,558 km2, ABOUT THE SIZE OF POLAND. THIS IS ABOUT 0.5% OF THE TOTAL LAND SURFACE OF THE CONTINENT. MUCH OF THESE HIGHHLANDES IS ARID AND INHOSPITABLE. IN OTHER WORDS, ALTHOUGH THE DEBATE WILL UNDOUBTEDY CONTINUE, THE FACT IS THAT, EVEN IF HIGHLAND MALARIA WILL MOVE TO HIGHER ALTITUDES, IT IS HARDLY RELEVANT TO THE PREVALENCE OF THE DISEASE ON THE CONTINENT. (Paul Reiter, Institut Pasteur)	Addressed
E-8-352	A	22	30		41	is this 22.5 and 26 degC threshold applicable to all regions? (Clair Hanson, IPCC TSU)	No! Addressed
E-8-353	A	22	37	22	37	This paragraph should be at the start of the section, not at the end! Moreover, it cannot be overemphasized that "the known causal links ..." are so varied that they cannot be defined in black and white.. In addotiom. there is no paucity of concurrent detailed historical observations on climate and malaria. On the contrary, there is a wealth of data, goiing back many centuries. In the 1920s, it was already clear that climate was a minor factor in malaria geography (For a review, try "Malaria in Europe, an ecological study" by L.W Hackett, Director of the International Health Division, Rocefeller Foundation. Oxford University Press, 1937. 336 pps). May I also suggest another of my publications, admittedly published in 2000, but ... : Reiter P, 2000. From Shakespeare to Defoe: malaria in England in the Little Ice Age. Emerg Infect Dis 6: 1-11. In the past 100 years, following Ross's discoveries (1898) there has been a wealth of climate/malaria data from all over the world, but especially Europe and North America. The authors should delve into the rich literature of the period 1900 - 1950; they will find all the data they need to refute this statement. (Paul Reiter, Institut Pasteur)	Addressed
E-8-354	A	22	44	22	45	This phrase omits reference on another important factor on rodent ´s dispersal. It is wood and rangeland ´s wildfires or provoked fires. The long-tailed mouse transmitting hantavirus diseases comes out from these habitats. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed

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E-8-355	A	22	46	22	46	should read 'Weil's disease' (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-356	A	22	49	22	49	should read 'streets' (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-357	A	22	51	23	2	the discussion on HPS should be expanded. There are a number of other studies not referenced here which also suggest a climate link, particularly when droughts are followed by floods. See for example, Epstein VR, Emerging disease and ecosystem instability, AJPH 1995; 85: 16E-8-172 and Pini et al, Hantavirus Infection in children in Argentina, Emerging Infectious Diseases 1998; 4: 85-87 (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-358	A	23	0			p23 in discussion of schistosomiasis it is odd not to see reference to potential impact arising from increased irrigated agriculture especially in areas where planning/management controls are weak or where irrigated agriculture is introduced without adequate planning (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-359	A	23	2	72		Sequences of extremes and wide swings from one extreme to the other can be especially disruptive to ecosystems and to predator/prey relationships that control rodent populations. Droughts can reduce rodent predators, while heavy rains can provide new growth of food sources for rodents and can drive hem from their burrows (Levins R, Epstein PR, Wilson ME, Morse SS, Slooff R, Eckardt I. Hantavirus disease emerging. The Lancet 1993; 342:1292; Epstein PR, Chikwenhere GP. Environmental factors in disease surveillance. The Lancet 1994; 343:1440-41). (Paul Epstein, Harvard Medical School)	Addressed
E-8-360	A	23	7	23	7	It is worth noting that the bush fires were mainly attributed to humans deliberately setting fire to the dry forest. (Paul Reiter, Institut Pasteur)	Addressed
E-8-361	A	23	12	23	16	Message of this paragraph is unclear. What are the implications of climate change for the distribution of schistosomiasis? If it is not know, this should be stated. Some of the other sections refer explicitly to implications of climate (e.g., Malaria on page 22 line 35). Each section should be consistent in this regard as this is exactly what the reader will be looking for. (Peter Berry, Health Canada)	Addressed
E-8-362	A	23	13	23	13	A reference on the ENSO effect to spread the snails populations would be useful (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-363	A	23	19		41	The contents of "occupational health" suggest to be deleted. In this section, the contents almost still are heat stroke or high temperature conditions, which have	Addressed

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						been stated in section 8.2.1. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	
E-8-364	A	23	21			Section 8.2.9. This analysis is one-sided. Yes, it is reasonable that temperatures that are too high can reduce productivity and these could increase. What about the potential benefits from fewer extreme cold temperatures? Don't these also reduce productivity. How do you know how this will come out on balance? Is there any literature looking at this comprehensively? This section ought to be revised to state what we know and don't know about heat stress, cold stress, and worker productivity. Furthermore per worker is most likely higher in mid- and high-latitude countries. So, the benefits of reduced cold-stress could be important. (Joel Smith, Stratus Consulting Inc.)	Addressed
E-8-365	A	23	27	23	28	It would useful to clarify whether the risk is of increased morbidity and/or mortality, also both of these occupational groups are exposed to high thermal loads by virtue of the kind of work they undertake. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-366	A	23	27		39	This section should reflect the reduction in deaths from a warmer climate. My study, referred to above shows a net reduction in deaths due to global warming. (Thomas Gale Moore, Stanford University)	Addressed
E-8-367	A	23	28			As evidenced by an increase in illnesses and deaths among these workers? The existence of these workers itself does not imply anything about health risks. (Peter Berry, Health Canada)	Addressed
E-8-368	A	23	30		41	Outdoor work in cold climates will be more efficient with a moderation of cold. So productivity will increase in cold climates with climate change. (Thomas Gale Moore, Stanford University)	Not Addressed
E-8-369	A	23	32	23	33	I strongly suspect that there is some mistake here. The text indicates that work is not affected until a wetbulb temperature is 26 C is reached. A 26 C wbt corresponds to a dry bulb temperature of 30.5 at 70% RH, and 40.5 at 30% RH. According to even the adaptive comfort standard of Brager and de Dear (2000), the upper limit that is acceptable to 80% of people is about 31 C, and it would seem that work output would be adversely affected as soon as people feel uncomfortable. 40 C and 30% RH is also well outside the comfort limit on Milne and Givoni's (1979) bioclimatic chart, even with natural ventilation. Also, is the typical reader going to know what wet bulb temperature is or how it is related to actual temperature and humidity? Finally, I've never seen the term "globe" in "wet bulb globe temperature". The common usage now seems to be just to say "wet bulb temperature". On page 37, line 1, a threshold is given in terms of directly measured temperature (35 C in arid conditions), which the reader can immediately relate to.	Addressed

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						<p>REFERENCES: Brager, G. S. and de Dear, R. (2000) ‘A standard for natural ventilation’, ASHRAE Journal 42(10):21-28. Milne, M. and Givoni, B. (1979) ‘Architectural design based on climate’ in Watson, D. (ed) Energy Conservation Through Building Design, McGraw-Hill, New York.</p> <p>(Danny Harvey, Dept of Geography, University of Toronto)</p>	
E-8-370	A	23	33			<p>globe --> global (Clair Hanson, IPCC TSU)</p>	Addressed
E-8-371	A	23	44	24	13	<p>The UV chapter lacks a call for “more research is needed”. We have not seen any studies using person-based UV monitoring (thus also capturing behavioral exposure patterns), the contentious issue of UV-B related generalized immune suppression is not resolved. It resurfaces from review to review without receiving more scientific evidence to undergird the claims of a link to vulnerability to infectious diseases. Even changes in immune response could have large effects on defense against IDs on a population level. To shed light into this association is all the more needed as the authors rightly state on pg 24, 2nd para that the cooling of the stratosphere may prolong the effect of ozon depletors, the problem of increased UV radiation is therefore not going away fast or completely, in spite of excellent protocols and their observance.</p> <p>(Rainer Sauerborn, Heidelberg University)</p>	Addressed
E-8-372	A	23	44			<p>Please also see WHO recent publication: Solar ultraviolet radiation: Global burden of disease from solar ultraviolet radiation. http://www.who.int/uv/publications/solaradgbd/en/index.html (von Hildebrand, WHO)</p>	Addressed
E-8-373	A	23	50	23	50	<p>There are not health benefits from exposing to UVB (320-280 nanometres) radiation. It is the UVA radiation (320 -400 nanometers) bringing this benefit. Vitamin D fixation depends on UVA. Exposure to UVB, as known, brings carcinoma and melanoma ´s development.</p> <p>(Osvaldo Canziani, IPCC WGII Co-chair)</p>	Addressed
E-8-374	A	24	2	24	2	<p>Osteoporosis is not classically a vitamin D deficincey disease- rather osteomalacia is due to Vitamin D deficiency in adulthood. However it is true that many elderly people who have osteoporosis do have low levels of vitamin D and may benefit from supplementation and/or light exposure</p> <p>(Andy Haines, London School of Hygiene & Tropical Medicine)</p>	Addressed
E-8-375	A	24	4	24	13	<p>Should here, in this chapter and within the WG II ´s responsibilities deal with the physics of climate change and total ozone (surface, troposphere and stratospheric) it would be opportune to cross refer to the IPCC Special Report on Safeguarding the</p>	Addressed

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						Ozone Layer and the Climate change System, its Chapter 1 Ozone and Climate, A review of interconnections, covers all aspects of interest, needing no to be repeated in chapter 8. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-376	A	24	4		13	this paragraph should be in the future impacts section (Clair Hanson, IPCC TSU)	Addressed
E-8-377	A	24	10	24	12	Is there any evidence that vaccine efficacy is reduced by ultraviolet exposure in humans or is this a theoretical possibility based on animal experiments? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-378	A	24	18	24	46	Health in scenarios The authors are very kind, saying “the use of scenarios to explore future effects of cc on population health is at an early stage of development”. Martens and Huynen were much more straightforward in their paper. I would be more severe with the scientific community with regard to the hopeless under-representation of health in scenarios of future effects of climate change. The need to develop and integrate health scenarios should be taken up in the research priorities, chapter 8.8. (Rainer Sauerborn, Heidelberg University)	Addressed
E-8-379	A	24	20	72		8.3.1 Health Scenarios - Line 20: Scenarios: Story lines based upon plausible causative connections can be generated based upon drivers (e.g. SRES emission scenarios), responses of the climate system (e.g. linear vs. non-linear with tipping points); and in impacts (Epstein and Mills 2005; Burkett VR, Wilcox DA, Stottlemeyer R, et al. Nonlinear dynamics in ecosystem response to climatic change: Case studies and policy implications. Ecological Complexity 2,357-394 (2005)). Surprising large health impacts could arise from 1) widespread heat waves; 2) recurrent storms; 3) epidemic spread after storms and/or drought; and 4) generation of large refugee populations. In addition, non-linear impacts affecting natural and managed systems – forests, crops, livestock, wildlife and marine life- could have devastating reverberations for human health and well-being. (Paul Epstein, Harvard Medical School)	Not Addressed
E-8-380	A	24	32			Suggest replacing "unravel" with "weaken" (Peter Berry, Health Canada)	Addressed
E-8-381	A	24	38			remove 'a' from 'a more' (Clair Hanson, IPCC TSU)	Addressed
E-8-382	A	24	41	24	46	"...that a deliberate focus on sustainability will be required to reduce the impacts of human activity on climate..." Paragraph, and in fact much of the chapter, suggests that major risks to health from climate change are and will be only faced by people in developing countries, which is not true (e.g., Europe heatwave 2003). Need to	Addressed

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						clearly indicate that developing countries will be hit the hardest and why, but also that climate change and health issues should be a concern for developed countries as well. Chapter needs a more sophisticated way of describing these risks and how vulnerability differs. Current messaging often implies that only certain countries are vulnerable. (Peter Berry, Health Canada)	
E-8-383	A	24	49			Part of the existing vulnerability is that most poor countries do not budget much funds for the health sector. WHO 2006 report looks in Annex Table 2, at selected indicators of health expenditure ratios, 1999–2003 www.who.int/whr/2006/annex/06_annex2_en.pdf (von Hildebrand, WHO)	Addressed
E-8-384	A	24	51	25	51	The discussion of vulnerability on page 25 is disjointed and unsystematic. There are many factors important for adaptive capacity which contribute to a reduction in vulnerability (e.g., economic resources, equity, institutions and programs (e.g., policies such as smog alerts), health status, skills and training, knowledge, new technologies etc). The analysis here spends a disproportionate time discussing 3 or 4 of these factors and specifically how they affect the vulnerability of developing countries. A much more useful analysis would examine a broader range of factors and their implications for vulnerability in developing and developed countries - how certain factors (e.g., income) are responsible for key differences in vulnerability. Also, need to be specific about why a factor is important for vulnerability. Why is health status important and why does it reduce coping capacity? Why are poverty and equity important - because poor countries/populations do not have the resources to develop needed surveillance systems etc etc. Also, why is urbanization important? It is true that urban areas tend to experience urban heat island effect more, but analysis here seems to suggest that increased urbanization will necessarily entail increased vulnerability for all cities. Are there not significant differences in vulnerability from urban area (city) to urban area currently? (Peter Berry, Health Canada)	Partly Addressed
E-8-385	A	25	23			insert 'growth and concentration' after population (Clair Hanson, IPCC TSU)	Addressed
E-8-386	A	25	31			change "reduced" to "decreased" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-387	A	25	31			can this reduction be quantified? (Clair Hanson, IPCC TSU)	Addressed
E-8-	A	25	33		33	"in Europe" should be "in Africa"	Addressed

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388						(Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	
E-8-389	A	25	33			“Europe” should be replaced by “Africa” according to the context. (Changke Wang, National Climate Center, CMA)	Addressed
E-8-390	A	25	34	25	36	Eliminate this sentence. First, in terms of head count -- rather than the number of countries -- fewer people are living in absolute poverty (defined as the number of people living below \$1 a day). [See World Bank, Global Economic Prospects 2005, Washington, DC, 2005.] Second, whether or not income inequalities have widened, inequalities in health outcomes have for the most part shrunk, although in certain areas (Sub-Saharan Africa, and the former Soviet Union, Eastern Europe), these inequalities rose in the 1980s and 1990s (Goklany 2002). More recent evidence indicates these trends have been reversing themselves in Eastern Europe and many parts of the former Soviet Union [See World Bank, World Development Indicators, 2006]." (Indur Goklany, US Department of the Interior)	Addressed
E-8-391	A	25	40	25	45	In light of the previous comments replace " Economic growth is double-sided ... economic growth (Szreter 2004)>" with the following: "Although historically economic growth as characterized, for instance by urbanization and land clearance initially contributed to poor public health (Szreter 2004), today the causes of these problems have been better understood and solutions to these problems have been devised. In fact, economic growth, by making solutions more affordable, is an important factor in advancing public health (Goklany 2001, 2002). The importance of economic growth arises because it allows societies -- and individuals -- to afford and obtain public health services and medical treatments that they could not otherwise access. Also, it allows societies to devote more resources for research and development in these areas, and develop human and social capital. By the same token, just as wealth can lead to better health, better health can stimulate greater economic growth (Goklany 2001, 2002)." (Indur Goklany, US Department of the Interior)	Addressed
E-8-392	A	25	42	25	45	This phrase on mistaken rapid economic growth is based on the null or very poor information available about the environmental consequences of exploiting, over-using natural resources, without accounting for the externalities. Nobody in the 19th and very few politicians of the late 20th century, have had thoughts about the critical implications of the environmental global changes. They started them without thinking or even believing that there would be such disastrous effects as we know now. Therefore, coming back to the need to choose sustainable development paths, knowing that there is a flagrant lack of data and interconnected social and economic information in many regions of the world and recognizing that the human	Addressed

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						society would have to live with the remaining resources of this unique world, this quotation must be used to remark the urgency for data and information so to assess the potentialities of the existing ecosystems, the implications of their overuse on the human health of future population (i.e. malnutrition for million of human beings) and the loses in natural ecosystems and their genetic wealth . Let us hope that this opportunity will be taken. It is hoped that this comment may serve the purpose to include in the TOD a clear statement of such basic needs and not only claim for more research. Without substantive geophysical, biological, social, economic, and even cultural and anthropological information, no model will resolve the goals of the IPCC. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-393	A	25	42			While rapid urbanization in the 19th century Western Europe did indeed lead to plummeting health consequences, it is no longer very relevant to the current situation. The drop in health status in 19th century Europe occurred because Europeans were unaware of germ theory, the importance of sanitation, or the other causes of their urban health problems. But once they figured out how to deal with them -- which the leading countries figured out before they even understood the causes -- health status improved rapidly (see Goklany 2001, p. 6). Importantly, today's developing nations have profited from the lessons of the developed countries. As a result, today health status is usually better in urban areas than in rural areas (Goklany 2001; p. 14-15, Figure 10). The text should be revised to reflect these considerations. (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-394	A	25	43	25	43	insert "in" between "Europe" and "the 19th Century" (Julius Fobil, School of Public Health, College of Health Sciences, University of Ghana)	Addressed
E-8-395	A	25	43			Similarly, despite extensive land clearance in South East Asia and South America, which might have affected particular subpopulations, overall health status, as measured by life expectancy, child and infant mortality (for instance) has advanced continually in these areas since the 1950s and 1960s. In many cases, land clearance alos resulted in the draining of swamps, which improves health status by reducing mosquito-borne diseases such as malaria (see, e.g., Goklany 2001, p. 16). (Indur Goklany, US Department of the Interior)	Addressed
E-8-396	A	25	43			insert 'during' after Europe (Clair Hanson, IPCC TSU)	Addressed
E-8-397	A	25	47	25	49	On line 49, just before the period (full stop), add the following, regardless of the cause of the disease (Goklany 2004)."	

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						(Indur Goklany, US Department of the Interior)	
E-8-398	A	25	47			Replace the first sentence in this para with the following: "REDUCING VULNERABILITY OF CURRENT POPULATIONS TO CLIMATE-SENSITIVE DISEASES provides a buffer against the hazards of CLIMATE, climate variability and climate change. EQUALLY IMPORTANT, SINCE THE POPULATION AT RISK (PAR) OF CLIMATE-SENSITIVE DISEASES BECAUSE OF ALL CAUSES WILL ALMOST CERTAINLY BE GREATER THAN THE POPULATION AT RISK ONLY BECAUSE OF CLIMATE CHANGE, SUCH REDUCTIONS ARE LIKELY TO BE MUCH LARGER THAN THOSE THAT CAN BE EFFECTED BY ONLY FOCUSING ON REDUCTIONS IN THE PAR DUE TO CLIMATE CHANGE (GOKLANY 2000a, 2003, 2005a)". (Indur Goklany, US Department of the Interior)	Addressed
E-8-399	A	25	48	25	48	change sentence to "effective anti-malarials, access to insecticide-treated bed nets or inclusion in indoor residual spraying programmes will have an important effect...." (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-400	A	26	2	26	11	There will need to be continued commitment of developed countries that export their surpluses of grain and other food stuffs to those countries with insufficient production, or those populations will need to have sufficient purchasing power to purchase food on the open market which currently they do not. Thus, assumptions about trends in poverty are a crucial determinant of malnutrition for the future. Another possible determinant would be the amount of land set aside for the production of biofuels. For example, if there is an aggressive policy to produce bioethanol and biodiesel, it could affect the availability of land for the production of grain and other food crops. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-401	A	26	2	26	2	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples heat island. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-402	A	26	8			replace "Parry et al estimate" with "It is estimated" [you cite Parry and others at the end of the sentence] (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-403	A	26	8			date for Parry et al (Clair Hanson, IPCC TSU)	Addressed
E-8-	A	26	11			Add a new sentence at the end of this para to read as follows: "This highlights the	Addressed

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404						importance of trade, aid and economic development in ensuring food security, particularly for areas which run food deficits (Goklany (1995, 1998, 2000a)." (Indur Goklany, US Department of the Interior)	
E-8-405	A	26	22	26	26	Does the Arctic Climate Impact Assessment not provide projections about how climate change could affect population health in Arctic countries? (Peter Berry, Health Canada)	Addressed
E-8-406	A	26	28	26	32	I am very uncomfortable with this paragraph which seems to indicate that the net health affects of climate change will somehow be neutral. Is the balance of health effects not predominantly negative? If not, why does this assessment spend 42 and a half of the 43 pages discussing the negative impacts and only one or two paragraphs discussing the positive impacts (without citing sources of information)? Such an analysis of net impacts is flawed because it does not account for (1) the speed the climate will change and the fact that more rapid climate change quickly leads to much more negative health impacts - WHO suggests climate change is proceeding more rapidly than we thought (2) synergistic impacts from multiple hazards - no person is affect by only one climate change health impact (3) cumulative impacts on health from climate change along with the many other global changes that are occurring rapidly and affecting health and well-being. If the scope of climate change impacts were not so great we could speak of the benefits. As it is, discussing the health benefits is akin the being robbed at gunpoint and suggesting that it wasn't so bad afterall because you got the rest of the day off work... (Peter Berry, Health Canada)	Addressed
E-8-407	A	26	37	26	37	What is meant here by a "quantitative model"? A biological model? A statistical model? I regret to say that the authors give the impression that they do not understand mathematical models of disease transmission. Which of them is a specialist in this field? (Paul Reiter, Institut Pasteur)	Addressed
E-8-408	A	26	41	26	43	The use of the word risk in the sentences is ambiguous. I would suggest "However, there are important differences between potential disease risk (on the basis of climatic and entomological considerations) and experienced morbidity and mortality. Although large portions of Europe and the United States may be at potential risk of for malaria based on the distribution of competent disease vectors....." (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-	A	26	50	27	4	Replace everything between "The assumption that ... easy-to-control diseases" with	Addressed

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409						the following: "Although economic growth is one of many factors affecting public health, its importance stems from the fact that it allows societies -- and individuals - - to afford public health services and medical treatments that they could not otherwise access. Also, it allows societies to devote more resources for research and development in these areas, and develop human and social capital. By the same taken, just as wealth can lead to better health, better health can stimulate greater economic growth (Goklany 2001, 2002; Pitcher, in press). (Indur Goklany, US Department of the Interior)	
E-8-410	A	27	2	27	3	"to" should be replaced by "of". "challenge to" means "someone refuses to accept that someone or something is right and legal". (Changke Wang, National Climatic Center, CMA)	Addressed
E-8-411	A	27	6			See WHO's report on BOD from the environment, issued this year: Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease at: http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/index.html (von Hildebrand, WHO)	Addressed
E-8-412	A	27	8	27	19	(1) As noted in our comments on the Executive Summary, this study is suspect. (2) Also as noted, the burdens of mortality and disease should also be provided in term the fraction of the corresponding global burdens. (Indur Goklany, US Department of the Interior)	Addressed, but it is not suspect
E-8-413	A	27	10	27	12	This is a staggering statement! 150,000 people killed in one year from climate change? This statement obviously needs much more than passing reference. The contribution of different factors, and in different regions, to the 150,000 number needs to be given, and the credibility and uncertainty of each factor assessed. If this number is credible, it should be highlighted in its own subsection, and should be highlighted in the Executive Summary of this chapter and in the Technical Summary and SPM for WGII. (Danny Harvey, Dept of Geography, University of Toronto)	Addressed, but no space to address this here; refer to www.who.int/globalchange
E-8-414	A	27	12	27	12	DALYs need defining (Andrew Morse, University of Liverpool)	Addressed
E-8-415	A	27	12			what does DALY stand for (Changke Wang, National Climatic Center, CMA)	Addressed
E-8-416	A	27	12			what are DALYs? Please define (Clair Hanson, IPCC TSU)	Addressed
E-8-417	A	27	19			Modify the last sentence ["Adjustments for adaptation were included in estimates"] to read as follows: "ALTHOUGH SOME SOCIOECONOMIC ADJUSTMENTS	Addressed

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						WERE MADE, MANY OTHER POTENTIAL ADJUSTMENTS WERE NOT INCLUDED. AS MCMICHAEL ET AL. (2004, P. 1560)), FOR INSTANCE, NOTE, THEY MADE NO ADJUSTMENTS FOR TECHNOLOGICAL CHANGE OR FOR SPECIFIC ACTIONS THAT WOULD BE TAKEN TO ADAPT TO CLIMATE CHANGE." (Indur Goklany, US Department of the Interior)	
E-8-418	A	27	26	27	28	The sentence, starting with "Warmer winter temperature...", states decrease in cardiovascular and respiratory disease in tropical and temperate regions. Intuitively, the positive effects of warmer winter temperature would be observed most in the cold climate region, but it was not mentioned. Many tropical countries do not even have a "winter" season. The fact should be checked. (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-419	A	27	30	27	30	GDP per capita?? (Andrew Morse, University of Liverpool)	Addressed
E-8-420	A	27	31	27	37	It would be helpful to clarify why there are differences between regions. Is this because there are different assumptions about the impact of climate change on crop production or differential trends in poverty or both? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-421	A	27	38	27	39	The sentence, starting with "Coastal flooding is projected to ...", implies that coastal flooding causes a very low burden of disease. There needs an explanation as to why it leads to a low burden of disease. (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-422	A	27	40	27	42	The increase in the altitudinal range of malaria, may well be more important than the latitudinal range because at the latitudinal edges of distribution, malaria is generally well controlled by vector control programmes in countries such as South Africa with a reasonably good infrastructure. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-423	A	27	44	28	48	8.4.1.2 Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples malaria. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-424	A	27	49	27	49	"Table 8.4 ... range of infectious diseases". This table is mostly about malaria, and dengue is mentioned once, so best to reword as these two diseases are not really a "RANGE of infectious disaeses". (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Addressed
E-8-	A	27		28		can an update of Fig 9.2 in the TAR be included in section 8.4.1.2?	Addressed

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425						(Clair Hanson, IPCC TSU)	
E-8-426	A	27				8.4.1.1 this section would benefit from a global map of e.g., malnutrition (based on relative risk) (Clair Hanson, IPCC TSU)	Addressed
E-8-427	A	28	3	28	6	The text should note that taking "current control capacity" into consideration is insufficient to make robust estimates of the effects of climate change in the future because among other things, it ignores changes in the numerous factors that would affect future adaptive capacity (e.g., changes in levels of economic and technological development, and human and social capital; see, e.g., Goklany 2006a, 2005c). (Indur Goklany, US Department of the Interior)	Partly Addressed
E-8-428	A	28	29	28	32	It would be helpful to clarify whether the increases in malaria are primarily due to plasmodium vivax rather than falciparum (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-429	A	28	35			Insert a new para that reads as follows: "Results of a study on the global impacts of climate change on the population at risk (PAR) of malaria in the 2080s indicate that through that period at least, the contribution of climate change to PAR is relatively small (~3%) compared to the contribution of non-climate-change related factors (Arnell et al. 2002). Results from Tanser et al. (2003) indicate that by 2100 climate change could increase the person-months of exposure in Africa by 16-28%. Both results indicate that focusing on reducing current vulnerabilities to malaria would provide a substantially greater target of opportunity than would actions that would focus merely on climate change at least through the 2080-2100 period), especially if the measures, technologies and services devised to address current vulnerabilities would also help curb malaria due to climate change (Goklany 2003, 2004). Such an approach would, moreover, be much more cost-effective through this period than would mitigation (Goklany 2005a)." (Indur Goklany, US Department of the Interior)	Addressed
E-8-430	A	28	39	28	40	Vapour pressure ... an odd parameter. I don't quite understand the model, nor its parameters. (Paul Reiter, Institut Pasteur)	Not Addressed; this is what the model is all about
E-8-431	A	28	40	28	41	insert "global" after "total" for clarification (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/Africa Centre for Health and Population Studies)	Addressed
E-8-432	A	28	42	28	42	Just to say that it is good to remark that some authors have thought in the importance of humidity, a failure noted before. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed

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E-8-433	A	28	43			Insert after the period on this line the following: " However, this study did not take any adaptations that are available today or would become available in the future if adaptive capacity expands into the future due to greater economic and technological development or changes in human and social capital that would be consistent with the assumptions embedded in the IPCC scenarios (Goklany 2006a)." (Indur Goklany, US Department of the Interior)	Addressed
E-8-434	A	28	46	28	48	This paragraph should have been included on page 20, lines 27-38. In that paragraph, there are statements that TB diseases are on the move, northwards and to higher altitudes, and that "climate change alone is unlikely to explain recent increases in tbd incidence ..." In articles referred to, however, is clear that the authors wish to attribute these changes to climate change. Yet here it is stated: "The only other vector-borne disease to be mapped and quantified for climate change impacts is TBE in Europe. Increased temperatures are projected to reduce the endemic range of this disease in Europe". (Paul Reiter, Institut Pasteur)	Addressed
E-8-435	A	28	46	28	48	I understand that the reduction in the range of disease in Europe, particularly central Europe, it likely to be due to increase drying as well as increased temperatures, it be helpful to mention this (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-436	A	28	46		48	can anything more be said about tick-bourne encephalitis? (Clair Hanson, IPCC TSU)	Not Addressed
E-8-437	A	28		28		"Dengue is an important climate sensitive disease..." The authors should refer to transmission in non-tropical areas in the past: large areas of the USA including Philadelphia, New York etc., Europe: Cadiz, Seville, Athens. Asia: Japan, China. South America: Buenos Aires. To my knowledge, climate is not the limiting factor in the range of Ae. aegypti in Australia. (By the way, somewhere in the text, there was reference to dengue in New Zealand. There is no dengue in New Zealand and, to my knowledge, never has been; certainly, Ae. aegypti and Ae. albopictus are absent, although some native species may be capable of transmission. (Paul Reiter, Institut Pasteur)	Partly Addressed, we agree there is no dengue in New Zealand
E-8-438	A	29	3	29	12	Note here that winter warming may lead to a decrease in cardiovascular morbidity/mortality, but that the effect is likely to be small. (Neville Nicholls, Monash University)	Partly Addressed, where studies available
E-8-439	A	29	6			instead of "temperature" "thermal stress" (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Not Addressed
E-8-440	A	29	9	29	12	I agree explicitly with this statement which deviates from the usually given statement that cold related deaths will be more reduced than heat related death	Addressed

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						increased (see example Ch. 12, p. 23, l.32.36. These people ignore the difference in the cause-effect relationship between cold- related and heat related deaths). (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	
E-8-441	A	29	14	29	15	The second half of the sentence (i.e."however, downscaling temperature projectins to urban areas is difficult") is not clear what it means. I believe it means that temperature projections at local level (sub-national level, as opposed to regional level) are difficult. It is not urban vs. rural. Perhaps, rewording is necessary. (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-442	A	29	14	29	22	I miss references. (Gerd Jendritzky, Meteorological Institute, University of Freiburg)	Addressed
E-8-443	A	29	14	29	22	Comment: Section 8.4.1.3, 2nd paragraph:The type of information (age, underlying health status of individual, etc.) that is needed on individual cases in order to estimate overall health burden in terms of DALYs is very challenging to gain access to at this point, in part owing to patient confidentiality protections. (Kim Knowlton, Columbia University)	Addressed
E-8-444	A	29	16	29	18	The sentence, starting with "Estimates of the burden of heat-related mortality...", would be easier to read, if we start with "When assumptions about acclimatization and adaptation are included in models, estimates of the burden of heat-related mortality... are reduced...". As it is now stated, the phrase "when assumptions about..." may be linked only to "not eliminated". (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-445	A	29	21			8.4.1.3 Line 21/22: Need to include Kalkstein et al. analog studies for US cities based on 2003 European heat wave (Kalkstein, L, Greene, J.S., Mills, D.M., Perrin, A.D. The development of analog European heat waves for U.S. cities to analyze impacts on heat-related mortality. BAMS, in press 2006). (Paul Epstein, Harvard Medical School)	Not addressed, not yet accepted in journal?
E-8-446	A	29	22	32	8	This section on urban pollution should include reference on the adverse impact of surface ozone in trees and gardens, having an important effect of human wellbeing, hence in human health, and also, this is very important, information on the short life of surface ozone, making impossible this pollutant long range transport (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-447	A	29	27			carbon dioxide? (Clair Hanson, IPCC TSU)	Addressed
E-8-448	A	29	32			Also, emissions depend on regulatory actions. (Alan Krupnick, Resources for the Future)	Addressed
E-8-449	A	29	33	29	33	At the end of the paragraph, replace "required" by "requisite" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed

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E-8-450	A	29	38	29	47	Comment: suggest inserting phrase in line 44 (after "...on climatic changes alone"): "and not including the effects of population growth, which will increase the numbers of people subject to high-ozone exposures." (Kim Knowlton, Columbia University)	Addressed
E-8-451	A	29	38		47	The Knowlton study, as it is described in table 8.6 is problematic as a basis for predicting climate-induced change in mortality. First, just from a reporting perspective, it is important to know what epi studies are being used. The recent Michelle Bell et al study is the only one I am aware of that presents convincing evidence of an ozone mortality linkage. Second, the emissions inventory is inappropriate, as it assumes "no change from USEPA 1996 inventory" where NOx and VOCs are doubtlessly going to be very different, based on a host of regulations implemented after that date. (Alan Krupnick, Resources for the Future)	Addressed
E-8-452	A	29	43	29	45	It should be noted that the monitoring of surface ozone and other pollutants is being perform in some cities in Latin America. The severe pollution cases in Santiago (Chile) and Mexico City are making part of urban pollution bibliography (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed, in SA chapter
E-8-453	A	30	0	30		I refrain from further comments on these models, except for that by Kuhn et al. What does "maps not quantified" mean? Also, there are several very important vectors, such as Anopheles sacharovi, that are on the move, though not because of climate change. (Paul Reiter, Institut Pasteur)	Addressed
E-8-454	A	30	1	30	1	The title of table 8.4 is not in agreement with the information in the table. Table info is limited to malaria and dengue (both mosquito borne disesaes), while the title is more general " infectious diseases and vector species" (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Addressed
E-8-455	A	30	1	31		Table 8.4: (1) There should be an additional column in this table that would report the population at risk (however defined) in the absence of climate change. (2) There should be an entry for results reported in Arnell et al. (2002). (3) There should be a note (either at the top or the very bottom) noting that unless otherwise indicated, the study did not consider either currently-available adaptations or adaptations that may become available in the future due to greater technological change, economic growth and social and human capital. (Indur Goklany, US Department of the Interior)	Addressed
E-8-456	A	30		30		Tanser et al study, change main results to "increases in person-months especially in highland areas but limited latitudinal expansion." (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/	Addressed

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						Africa Centre for Health and Population Studies)	
E-8-457	A	31				T8.5: under US example A1fi --> A1FI (Clair Hanson, IPCC TSU)	Addressed
E-8-458	A	32	0			p32 it is odd that in the urban versus rural discussion there is no reference to relative access to health services and associated potential capacity to mitigate adverse outcomes (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-459	A	32	8	32	8	Comment: suggest inserting new citation after "Bergin et al. 2005": (citation to insert) "Holloway et al. 2003"; reference to add to bibliography: "Holloway, T., A. Fiore, and M.G. Hastings, 2003: Intercontinentel transport of air pollution: will emerging science lead to a new hemispheric treaty? Env Sci & Technol, 37, 4535-42. (Kim Knowlton, Columbia University)	Not Addressed
E-8-460	A	32	11	32	22	The section 8.4.2 shall refer to the highly vulnerable populations in mountain regions with glaciers, where their rapid retreat an00d the formation of lakes in the melting glacier give rise to deadly GLOFs (Glacier lake outburst floods). Cross reference with chapter 3 may easily cover this question. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-461	A	32	22	32	24	If there is limited literature to assess vulnerabilities for these groups how can we say current vulnerabilities are high and progress on reducing these has been slow? (Peter Berry, Health Canada)	Addressed
E-8-462	A	32	24	33	13	Climate change makes more vulnerable those poor , indigent population groups, living in slums and squatter settlements. So is correctly expressed in this subsection 8.4.2.1. But, the neighborhoods to these precarious settlements are also affected by the enhanced danger of diseases transmission, either directly (people to people) or due to the migration of insects, flies, mosquitoes,and the different rodents and other animals coming from these settlements to the city. The WHO Report Our Planet, Our Health reports on these issues. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-463	A	32	28	32	28	From the analysis presented it seems that poor urban planning and not urbanization is responsible for increasing vulnerability - this should be made clear. There could be many large cities in the future that are less vulnerable because of proper planning. What might be particularly important regarding urbanization is the fact that it substantially increases exposure to hazards and this could increase vulnerability, even with good urban planning. (Peter Berry, Health Canada)	Addressed
E-8-	A	32	44	32	46	Is this vivax or falciparum malaria?	

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464						(Andy Haines, London School of Hygiene & Tropical Medicine)	
E-8-465	A	33	1	33		Table 8.6, Comment: Please alter the description of Knowlton et al. 2004 study in one of two ways, to more accurately reflect the contribution of projected population change as delineated in their study: (1) Since the projected percentage changes in ozone-related mortality (4.5% and 4.4%) from Knowlton et al. 2004 were both derived from population-constant assumptions, change copy in column "Population projections and non-climate assumptions" to delete "A2 population projection, with 2000 age structure (no ageing)." and instead read, "Population and age structure held constant at year 2000." -OR- (2) Leave language in column "Population projections and non-climate assumptions" as it is now and add into column, "Main results" this copy at end: "A2 climate, precursors, and population growth: 59.9% increase in ozone-related deaths." (Kim Knowlton, Columbia University)	Addressed
E-8-466	A	33	5	33	5	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition. Some examples heat island. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-467	A	33	7	33	9	What about changes in individual behaviour? This is often the most important and at the same time most difficult thing to change, at least in developed countries. Importantly, even if you have the requisite government policies in place maladaptive individual behaviours (e.g., risky behaviour, not preparing for emergencies) can negate the affects of the policies. (Peter Berry, Health Canada)	Addressed
E-8-468	A	33	7	33	9	It is not clear which decision-making practices are being referred to here. Presumably it refers to policymaking which will determine the standards used in housing etc for energy conservation and use of natural ventilation to cool housing? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-469	A	33	11	33	13	since poverty is such an important determinant of health, it would be useful to expand on this point since if climate change results in increased poverty in some parts of the world, this could be a major mechanism by which it impacts on health (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-470	A	33	14			Many coastal urban centers in developed and developing nations are increasingly vulnerable to storms, sea level rise and storm surges. Sea level rise and storms can take an enormous toll on human life, leave breeding grounds for mosquito-, rodent- and water-borne diseases, and generate large numbers of displaced persons and refugees. (Paul Epstein, Harvard Medical School)	Addressed

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E-8-471	A	33	15			Section 8.4.2.2: Should note that rural populations are in many cases worse off from the point of view of health status than urban populations. See comments (above) on page 25, line 42. (Indur Goklany, US Department of the Interior)	Addressed, partly
E-8-472	A	33	17			affects --> effects (Clair Hanson, IPCC TSU)	Addressed
E-8-473	A	33	18			There is much more to "food insecurity" than the ability to produce food. It also depends on the ability of individuals to obtain and buy food, as well as social safety nets -- hence the importance of trade and economic development (including livelihoods) (see Goklany 1995, 1998). (Indur Goklany, US Department of the Interior)	Addressed
E-8-474	A	33	20	33	20	After damage, between of and land add "cropping" and after floods add a coma and "droughts. The paragraph will then read "loss of cropping lands through floods, droughts and sea level rise." (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-475	A	34	2	34	6	Much of the increase in global cereal production is likely to be in temperate regions rather than regions where malnutrition is common (see earlier comments) (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-476	A	34	11	34	13	I presume the decline takes into account the likely effects of climate change? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-477	A	34	19	34	22	This is unclear but I think it means that in Mali, the range of estimates for the increase in the risk of hunger, is between 64% and 72% by the 2050s (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-478	A	34	20			Confused numbers, 34% to 64% to 72%, should be change to "34% to 64%-72%" according to the original reference (Butt et al, 2005). (Changke Wang, National Climate Center, CMA)	Addressed
E-8-479	A	34	36			of --> on (Clair Hanson, IPCC TSU)	Addressed
E-8-480	A	34	38	34	42	Not all phytoplankton are likely to increase with global warming so it might be good to clarify that there are substantial difference in the sensitivity of different species. At this point you might also mention the increased risk of ciguatera poisoning, particularly in the Pacific. this poisoning leads to neurological symptoms and affects around 50,000 people per annum. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-481	A	34	41		42	how do algal blooms in the North Sea affect human health? (Clair Hanson, IPCC TSU)	Addressed
E-8-	A	34	49	34	49	It would be helpful to explain the differences between the four scenarios,	

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482						particularly as the A2 has a substantial impact on the increase in the number of people flooded (Andy Haines, London School of Hygiene & Tropical Medicine)	
E-8-483	A	35	18			why use mm here when the rest of this paragraph uses m? (Clair Hanson, IPCC TSU)	Addressed
E-8-484	A	35	25	35	27	Since all countries in South America, lying at the sides of the Andes Cordillera (these are 7 of the 13 countries in this sub-continent, it would be better say so and cross refer to the regional chapter., to obviate naming seven countries. Instead of the countries simply say "the Andes Cordillera" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-485	A	35	33	35	39	For references about GLOFs and rapid retreat of glaciers in South America, cross-refer to Chapter 13.: (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-486	A	35	35	35	35	Cite Epstein et al. 1998 (Paul Epstein, Harvard Medical School)	Not Addressed, as already in TAR
E-8-487	A	35	41	36	23	This paragraph is missing some reference to the South Pole. Although the Antarctic is an uninhabited continent, there are a number of scientific installations with a number of people. During the summer, some of them house familiars of scientists and there is tourism activity. Therefore some reference on the increasing UVB radiation reaching the surface, due to the stratospheric ozone layer ´s depletion, would be, though small, a reference for the health problem, within the South Polar Circle. (Osvaldo Canziani, IPCC WGII Co-chair)	Not Addressed
E-8-488	A	35	50			Add a new para on line 50 that would read as follows: "Nevertheless, despite the significant warming of the Arctic regions over the last few decades, available data shows that life expectancies have improved for most populations resident in the Arctic regions (see, e.g., Arctic Human Development Report, p. 27, available at http://www.svs.is/AHDR/AHDR%20chapters/AHDR_chp%202.pdf ." [Note: Data for Finland and Russian Arctic populations are not available. And we know that life expectancy has deteriorated in Russia for the entire population, especially for males; I assume that's also the case for the populations of the Russian Arctic.] (Indur Goklany, US Department of the Interior)	Not Addressed
E-8-489	A	36	8			change "are" to "is", because the subject is "an increase" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-490	A	36	24	36	24	Accelerating changes in the Artic have begun to take a large toll on emotional and mental health, and community bonds (ACIA, 2005). Depression, alcoholism, fight-induced injuries, and suicides have increased and are projected to increase further	Not Addressed; pats included in arctic chapter

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						as towns are lost and others are disrupted. (Paul Epstein, Harvard Medical School)	
E-8-491	A	36	26	37	6	Reading this important section, it is noticed that there is no reference on the need to improve, very particularly in developing regions, the building of national / regional data banks with the effects of extreme weather events, the effects of climate change on health, DALYs information and even the effect of increasing surface ozone concentrations impairing mental and physical activities. Moreover, as mentioned before, the increasing water vapor content in the air masses, due to higher temperatures and humid air advection from the oceans and seas warmed by the increased greenhouse effect, should be reported.(Ref. Burch and de Pasquale, Tulane University USA) . (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-492	A	36	26			Was TERIs' study included here? (von Hildebrand, WHO)	No was not included.
E-8-493	A	36	26			Section 8.5 - it would be good to refer here to the 'Copenhagen Consensus' in which climate change is ranked well below other investments in terms of the likely welfare benefits that it could bring. The problem with the Copenhagen Consensus analysis is that it compares investments in interventions where cost-effectiveness is quite well established such as for specific diseases, with climate change in which the processes and impacts are still imperfectly understood, and where the economic analyses have only considered a limited range of impacts. Therefore it exemplifies the difficulties of undertaking economic analysis where there are such major uncertainties but where severe adverse events are entirely plausible. (Andy Haines, London School of Hygiene & Tropical Medicine)	Not Addressed, because it does not speak about the costs of climate change
E-8-494	A	36	32	36	33	This statement is meaningless - the reader needs to know how much climatic change is assumed, and what discount rate was used. (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-495	A	36	32	36	32	It is not clear what the global economic value of loss of life due to climate change refers to (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-496	A	36	34	36	40	There should be an indication as to whether -- and how well -- the studies considered secular technological changes and climate-change-specific technological development in their assessments. (Indur Goklany, US Department of the Interior)	Addressed
E-8-497	A	36	42			isn't the subject "range"? If so, change "are" to "is". (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-	A	36	42		49	I take issue with "where economists traditionally value life less" on two grounds.	Addressed

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498						Economists are analyzing not valuing and the values they seek are not the value of a life, they seek information on people's preferences, specifically, the willingness of people to pay for mortality risk reductions. Beyond these points, the issue of value statistical lives less in developing countries is a fact of life because their incomes are so much less and, by definition, "monetary values" are constrained by income. The exact relationship between income and willingness to pay (WTP) is a matter of dispute; even whether there is any stable relationship is a matter of dispute. But such differences, pretty much follow from basic tenants of neoclassical welfare economics. Overall, it appears that the authors are trying to ram too many ideas into too small a space, so I would recommend increasing the space allocated to them so the arguments can be reasonably presented. (Alan Krupnick, Resources for the Future)	
E-8-499	A	36	45	36	45	should read 'economists' (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-500	A	36	47			change "five times" to "a factor of five" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-501	A	37	2			when does reduced work capacity begin? If it begins when people find the temperature uncomfortably hot, then it begins at temperatures much cooler than 35 C in office environments. According to research on adaptive comfort standards (taking into account psychological expectations as conditioned by the outside temperature), 80% of subjects find temperatures of up to 31 C acceptable in naturally ventilated offices. See Brager, G. S. and de Dear, R. (2000) 'A standard for natural ventilation', ASHRAE Journal 42(10):21-28. I extensively reviewed the literature on indoor comfort in Section 7.2 of my book, "A Handbook on Low-Energy Buildings and District Energy Systems: Fundamentals, Techniques and Examples" (James and James, London, 2006). It can be cited as indicating a threshold for thermal discomfort of 2E-8-31 C in office environments. (Danny Harvey, Dept of Geography, University of Toronto)	Addressed, substantially shortened
E-8-502	A	37	7	72	7	P37/72 Line7: Epidemics can have large economic consequences beyond the direct health costs. The outbreak of cholera in Peru in 1991 for example, led to hundreds of millions of dollars loss. (Paul Epstein, Harvard Medical School)	Addressed
E-8-503	A	37	9	37	35	This paragraph may well be reduced in extension, the cancellation of some repeated messages will allow for that. Regarding the phrase starting on line 12, it is felt that it would be wiser to place "change" or "diversify", instead of "increase". This modification does not mean any burden reduction, on the contrary, changes or	Addressed

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						diversifications would bring additional problems in the treatment of illnesses, lost of comfort conditions, etc, simply because such changes/diversifications may well bring additional variables to take into account (i.e. floods and droughts modifying the thresholds for water-borne diseases; higher absolute air humidity bringing different problems, depending on the prevalent air temperature and the average age of the population, etc). (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-504	A	37	9	37	15	Comment: Very important points brought forward here re: health problems under a changing climate are largely the same health problems being faced today. (Kim Knowlton, Columbia University)	Addressed
E-8-505	A	37	9	43		The section of Adaptation is too long and too detailed, it is should be shortened. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Addressed
E-8-506	A	37	25	37	29	Comment: This para. On "prerequisties for adpatation" is very cogent and a key point in linking climate change to sustainable development goals (Kim Knowlton, Columbia University)	Addressed
E-8-507	A	37	38	38	41	This sub-section 8.6.1., on approaches at different scales, should be complemented with information on actions already developed at a regional scale, as in the case with the forecasting of seasonal and inter-annual climate variability and its utilization in multipurpose applications, human health being one. In this regard, appropriate coordination of regional / sub-regional bodies regarding the monitoring of forests and rangelands wildfires as well as provoked fires, would permit a better control of trans-boundary transportation of gaseous pollutants and particulates and the opportune implementation of health warnings. Regarding actions at national levels, once again, decision makers should be informed on the need to improve information on health-weather-climate parametric components and variables to improve seasonal health 's conditions watching and the formulation of early warning. Future actions should, as in the already mentioned case of health forecasts (UK) develop similar efforts in other countries. In this regard, decision makers shall be adviced on the need to improve their information sources (geophysical, social, economic and even cultural). (Osvaldo Canziani, IPCC WGII Co-chair)	Partly Addressed. We have tried to include examples, where the literarure is available
E-8-508	A	38	0			I was surprised that the section on community level responses (p38) had nothing on preparedness in sensitive economic sectors. Planning for more frequent extreme events - in the water supply sector for example - could have a significant impact but requires a long-term perspective (Jamie Bartram, Water, Sanitation and Health Programme)	Not Addressed
E-8-	A	38	14		16	give examples of where this applies	Addressed

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509						(Clair Hanson, IPCC TSU)	
E-8-510	A	38	19			Section 8.6.1.2. This section still reads as though it is only about early warning systems - a more introductory general sentence on national-level actions would be useful (e.g. national coordination and policy on health system preparedness and emergency response) (Roger Few, University of East Anglia)	Addressed
E-8-511	A	38	37	38	37	"Phonpei" should read "Pohnpei". (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-512	A	38	43			Mention the community based pest and vector maangement approaches that have been and now increasingly been implemented with FAO, UNEP and WHO support, not because of climate change, but community based IPVM will be one way by which increased burden of disease from food lost to pest and lifes to disease vector outbreaks, should they occur from climate change, could be reduced The full report of the evaluation of the Integrated Pest and Vector Management (IPVM) project in Sri Lanka, prepared for WHO by A. von Hildebrand, H. van den Berg, V. Rangunathan, P.K. Das., June 2006. wil be published in August 2006. Here is the executive summary. Executive summary Background Integrated Pest and Vector Management (IPVM) builds upon the successful experience in Integrated Pest Management (IPM), which is based on the practical, field-based education of groups of rice farmers in weekly sessions of the Farmer Field Schools (FFS). Farmers learn the skills of observation-based crop management to grow better crops in healthier environments and less dependent on the use of insecticides. The wetland rice environment, while providing food and fodder, also supports breeding of the vectors of human diseases. The IPVM project in Sri Lanka, which started in 2002 with support from FAO and UNEP, has been unique in connecting vector management with agricultural activities thereby actively involving farming communities in observation-based decision-making on vector management. An evaluation mission was organized by WHO's South-East Asia Regional Office on the effectiveness, sustainability and replicability of the project to assist in the implementation of WHO's new strategy on Integrated Vector Management (IVM). General findings The mission team observed that the project is basically on the right track. Visits to IPVM Farmer Field School activities (see locations in Figure 1) and discussions with FFS alumni demonstrated that farmers can identify and monitor larval and	Addressed

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						<p>adult populations of the major mosquito genera, farmers are able to analyze their agricultural and peri-domestic environments and make sound decisions on the management of vectors in a sustained manner, pests and crops. FFS alumni reported a sharp drop in insecticide use attributable to the training. Vector management activities are being practiced after FFS training, including small-scale local rearing of fish, clearing of coconut husks and containers, covering water containers at regular time intervals, use of mosquito bed nets, and group action on household and village sanitation. Initial research findings generated during the project suggest that the role of farmers in vector management is most crucial in the short-rainy season when clustered ecosystem management was associated with lower anopheline mosquito densities, which can potentially break the transmission cycle. This effect was not observed in the long rainy season. The role of agricultural use of insecticides on mosquito dynamics needs further study. IPVM lead to increased use of bed nets. The team developed frameworks for monitoring of project performance and evaluation of project impacts. Recurrent costs of the FFS are approximately \$10 per graduated farmer.</p> <p>Curriculum The reduction of health risks in irrigated agriculture can be made more explicit in the FFS curriculum. Health risks are not limited to vector-borne disease but include harmful effects of pesticide use in agriculture on occupational poisoning and food safety. The mission recommended inclusion of exercises on self-monitoring of signs and symptoms at acute pesticide poisoning into the FFS curriculum. The mission also recommended broadening of the FFS activities to include field walks in other crops grown by rice farmers where pesticides are used to address pesticide-related health risks in a more comprehensive way.</p> <p>Convergence The mission found that convergence between activities by the health and agriculture sectors have come a long way, producing effective cross-sector learning and a joint process of curriculum development. However, there is a need to further enhance convergence. In particular, the roles and activities of the two sectors could become better integrated. This can be achieved by district-level workshops for all local stakeholders and by better synchronization of mosquito surveys by the Anti-Malaria Campaign (AMC) with weekly FFS activities to allow for interaction with farmers resulting in mutual benefits.</p> <p>Vector control The AMC has so far been playing a supplementary role by supporting a predominantly agriculture-driven project. The main challenge for AMC is to</p>	

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						<p>internalize IPVM into its own vector-borne disease control strategy. In fact, AMC has started to adopt IPVM as prevention strategy in low transmission areas, and there is prospect to extent this strategy to intermediate transmission areas because of the demonstrated synergistic effect between IPVM and bed net use. Moreover, the current surveillance system of the AMC, aiming to detect early warning signals of disease outbreaks to initiate action, is constrained by limited human and financial resources. Surveillance could benefit from involving communities and developing local capability on monitoring and evaluation as part of an IPVM strategy. This would provide better coverage and intervals of data collection, allowing the AMC to target their interventions (FFS or bed nets) more accurately and more timely. Community-based surveillance would also enhance local project ownership and preventive actions taken by local people.</p> <p>Next steps</p> <p>There was a strong overall consensus among the directors of AMC and Environmental & Occupational Health (EOH), Ministry of Health of Sri Lanka, WHO and FAO about the value of IPVM to involve local people in reducing and evaluating health risks related to vector-borne diseases and chemical pesticides. However, the sensitization of policy makers, particularly in the health sector, is a priority. WHO-SEARO will support the production of a short video to publicize IPVM. The Director EOH, who joined the mission team’s field visits, will introduce IPVM at a national session of the Health Development Committee Meeting to announce a short seminar on IPVM. WHO-Sri Lanka agreed to organize and sponsor the seminar, which will bring together major players from the Health Ministry and other partners to discuss the value of IPVM and identify common objectives and possible synergistic effects. In parallel, the mission findings and the video will serve as inputs to the regional IVM workshop, planned for October 2006, probably in Pondicherry, India, to discuss prospects for replication of IPVM in other countries and as part of the health emergency response in and after natural disasters.</p> <p>Conclusions</p> <p>i) The project is on the right track, and the mission’s findings suggest that farmers can become masters in analyzing their agro-ecosystems, including the vector component.</p> <p>ii) The IPVM-FFS intervention results in drastic reductions in insecticide use in agriculture.</p> <p>iii) Sustained environmental control of mosquito breeding is being practiced by IPVM alumni, mostly in the peri-domestic environment, contributing to risk</p>	

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						<p>reduction of vector-borne disease at the community level. Also, bed net use has reportedly increased after FFS participation, which suggests that IPVM amplifies the benefits of public health services.</p> <p>iv) IPVM alumni are empowered to proactively approach the public health sector on issues related to vector-borne diseases.</p> <p>v) Convergence between health and agriculture sectors has come a long way, but needs to be strengthened at the field level and district level.</p> <p>vi) The Anti Malaria Campaign has initially played a supplementary role in the IPVM project, but is agreeing to adopt IPVM as prevention strategy in low transmission areas.</p> <p>Recommendations</p> <p>i) Expand the curriculum to include health risks due to acute pesticide poisoning, and to include other crops grown by rice farmers where pesticides are used. Moreover, a participatory assessment of local problems is needed before the FFS as a basis for tailoring the curriculum to meet local needs.</p> <p>ii) Document and publicize the results and effects of the IPVM project, e.g. by the preparation of a video and presentations at national and international workshops.</p> <p>iii) Involve more public health staff and key stakeholders at the district level (school teachers, FBOs and NGOs) in field activities and workshops.</p> <p>iv) Increase convergence between the entomological surveys and the Farmer Field Schools to optimize interaction and mutual benefits of these activities at the field level.</p> <p>v) Collect data on the outcomes, effects and impacts of IPVM. Also, studies are needed on the effects of agricultural use of pesticides on mosquito population dynamics.</p> <p>vi) Sensitize policy makers of the health, agriculture and other sectors and facilitate discussion about common objectives related to IPVM.</p> <p>vii) Involve communities in the surveillance of mosquito vector populations and develop a community-based surveillance system to provide better coverage and intervals of data collection and to enhance the ownership of rural people in the evaluation and preventive action for vector-borne disease control.</p> <p>viii) Explore possibilities to incorporate IPVM in other projects, for example in relation to public health, food safety or biodiversity.</p> <p>ix) Expand the project horizontally in Sri Lanka beyond its present pilot sphere, and explore the opportunities for replication of IPVM in India.</p> <p>x) Carry out sampling of marketed food items to analyze the concentration of chemical residues before and after IPVM interventions</p>	

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						<p>Rationale and mission objectives</p> <p>Malaria and other vector-borne diseases like lymphatic filariasis, leishmaniasis, Japanese encephalitis and dengue are a major health problem in the South East Asia Region (WHO, 2004a). Moreover, the 2004 tsunami evidenced the vulnerability of affected communities to risk factors linked to vector-borne diseases in coastal areas due to new opportunities for vector breeding, worsened sanitary and housing conditions, breakdown of health services, movements of non-immune people and weakened nutritional status of the displaced population. In the wake of increased drug resistance and insecticide resistance in disease vectors, there is a need for establishing integrated sustained vector management strategies which are less reliant on chemical methods for disease control and engage other sectors and local communities in ecosystem management to reduce health risks.</p> <p>The Integrated Pest and Vector Management (IPVM) project in Sri Lanka has for the first time integrated vector management with farmer education in agriculture, thus involving rural communities in reducing the health risks of vector-borne disease. The new IPVM approach could potentially benefit other communitiesI in the country and in the region, including those affected by natural disasters. In preparation of a regional workshop related to integrated vector management and integrated pest management in the South East Asia region, in October 2006, an assessment is needed of the unique IPVM project in Sri Lanka.</p> <p>Hence, the main objectives of the mission were:</p> <ol style="list-style-type: none"> 1. To determine the effectiveness, sustainability and replicability of the IPVM approach in Sri Lanka 2. To explore prospects for replication in the country itself and beyond <p>(von Hildebrand, WHO)</p>	
E-8-513	A	39	12			<p>add a paragraph "in China, it seems to have a relation that LaNina years caused more numbers of landing typhoons as well as more digestive system cases than ElNino years according to the data of six years in 1990s(Zhao,ZC,et al.2000). (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)</p>	Addressed
E-8-514	A	39	13	39	13	<p>Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of repetition.Some examples malaria. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)</p>	Addressed
E-8-515	A	39	21	39	28	<p>Since Meteorological Services are currently providing data and forecasts on daily UVB radiation reaching the ground, individuals should be educated to take care of excessive exposures,particularly in summer time.</p>	Addressed

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						(Osvaldo Canziani, IPCC WGII Co-chair) Addressed	
E-8-516	A	39	21			Section 8.6.1.4. This section also implies response/adaptation only relates to EWS. See e.g. Few and Matthies (2006), p84, pp137-140 for further examples of individual-level responses to health risks from hazards. (Roger Few, University of East Anglia)	Addressed
E-8-517	A	39	24	39	24	. 'period' required after warnings (Andrew Morse, University of Liverpool)	Addressed
E-8-518	A	39	24			full stop after 'warnings' (Clair Hanson, IPCC TSU)	Addressed
E-8-519	A	39	32			Page 39 line 32 et seq I find the role of preventive health in complementing health care confused and this is not assisted by the different interpretation of 'primary health care' including or excluding primary prevention. I would suggest relatively minor word-smithing to ensure that primary prevention measures are properly integrated (eg primary prevention of diarrhoeal disease). (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-520	A	39	34	39	37	This phrase, referring the burden of climate-sensitive diseases and vectors/transmitters, should remember decision makers that the increasingly common location of national and international migrators in the outskirts of large cities (slums, favelas, villas miseria, shanty settlements) and more recently in open inner areas and empty buildings, squatters in some cities (as it happens in Buenos Aires and other LA cities), gives another dimension to preventive medicine which, as it was shown in the WHO Report of the Panel on Urbanization (WHO Commission on Health and Environment,1992), calls for additional adaptation to prevent ill-health outcomes. Climate change and extreme events already cause the exacerbation of this migratory displacements and the correlate effects on public health (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-521	A	39	40	39	45	This is a very long sentence and rather complex. It would be better to break this up into two or three shorter sentences (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-522	A	40	29			should read "Community-based" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-523	A	40	29			base --> based (Clair Hanson, IPCC TSU)	Addressed
E-8-524	A	40	31	40	32	This phrase may be improved adding other urban components which, in addition to enhancing the "urban heat island effect", would help in reducing the surface ozone generation by transportation means. Therefore the phrase could say: "The design of	Addressed

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						efficient transportation systems, with traffic ruling reducing the idle operation of fuel engines, the improvement of urban energy distribution, the appropriate design of sewage systems, will reduce the effect of urban pollution, the generation of surface ozone, the formation of heat islands and the appropriate management of urban storm water hydrology. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-525	A	40	42	41	21	This interesting sub-section suggest that some small adjustments would give a better picture of the boundaries within which health services should search for adaptation to climate change. The first sentence, starting in line 44 should need an addition lo locate the health problem within the correct boundaries. This would be in the form of a preceding phrase saying: "In addition to the factors resulting from regional / local environmental conditions, the degree to which etc" (here continues the existing first line of this sentence. In line 47 and "s" is missing, it is "measures" and no "measure". In line 48, it would be more direct to say "will on the part of those who distribute these resources to assign funds and means for adaptation measures" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-526	A	40	42			Modify title to read as follows: "Constraints to more effective adaptation". (Indur Goklany, US Department of the Interior)	Addressed
E-8-527	A	40	47			measure - add an s to the end (Clair Hanson, IPCC TSU)	Addressed
E-8-528	A	40				Box 8.5 isn't referred to in the text (Clair Hanson, IPCC TSU)	Addressed
E-8-529	A	41	0			Page 41 (and chapter 3 presumably) should refer to international Guidelines on safe use of wastewater (the updated third edition of which is published in 2006 by WHO). It is not appropriate to categorise them as 'strict to prevent health impacts' since available evidence shows that health impacts can be controlled by measures that are reasonably widely applicable. The statement on line 45-46 is misleading. There are many health-protective measures other than treatment and many of these measures can be widely applied (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed
E-8-530	A	41	1	41	2	The phrase starting with "Measures not in accordance, etc" should better read as follows: Also measures opposing the local laws, regulations and social customs and conventionalisms would fail to succeed. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-531	A	41	3	41	3	Some topics are treated at various places. If this could be avoided (for example with cross references) the text would become clearer without giving the impression of	Addressed

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						repetition. Some examples malaria. The same remarks are true for diarrhea, etc (Yola Verhasselt, Royal Academy of Overseas Services)	
E-8-532	A	41	4	41	4	The phrase stating “Increasing etc” could, aiming to a better decision making response, be improved saying “ Appropriate outreaching, leading to people ´s conscientiousness and increasing awareness of, tec” (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-533	A	41	8		21	Given the Katrina disaster in government responsiveness and that this was in a developed country, I think that rates a box on its own to show how incompetent governments can be in there responses. (Alan Krupnick, Resources for the Future)	Addressed
E-8-534	A	41	8			Change both instances of "limitations" to "constraints". (Indur Goklany, US Department of the Interior)	Addressed
E-8-535	A	41	11	41	11	Since the problem presented in this line ´s phrase is already standing, it would be better to read : “Therefore as it is now, over the medium=term, the poor, etc” (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-536	A	41	11	41	12	Modify the sentence beginning on line 11 with the following: "Over the medium term, DESPITE ECONOMIC GROWTH, TODAY'S POOR POPULATIONS ARE LIKELY TO BE MORE vulnerable, AND with FEWER options for adapting to climate change THAN RICHER COUNTRIES." Rationale: This is more accurate, especially if the world unfolds per the SRES scenarios. (Indur Goklany, US Department of the Interior)	Addressed
E-8-537	A	41	20	41	21	It is not only for poor communities but also for indigenous groups living under limited resources conditions, that adaptation would be delayed. Therefore, it would be better read “Unless effectively addressed, reduced capabilities, slow economic development and other socio=economic factors will continue to increasing human health vulnerability to climate change, in poor and indigenous communities” (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-538	A	41	20			Eliminate "economic development". The lesson of China and India over the past 15-20 years is that economic development (which includes livelihoods) is the best route out of getting large segments of the population out of poverty. See, e.g., World Bank, Global Economic Prospects 2005 , page 1, available at http://siteresources.worldbank.org/INTGEP2005/Resources/GEP107053_Ch01.pdf . (Indur Goklany, US Department of the Interior)	Partly Addressed
E-8-539	A	41	24	72		NB. This is a repeat, as the first mention of this may not go to the health chapter authors. Adaptation – this is a crucial point, omitted throughout. Distributed generation with clean energy technologies can optimize adaptation and mitigation. It can improve adaptation, enhancing energy security in the face of storms, heat	Addressed

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						waves and supply interruptions; improve public health, agriculture and poverty alleviations; and spur markets for technologies to mitigate climate change. The public health benefits of water purification (with solar), pumping for household use and irrigation, washing, cooking, and sanitation are clear; energy and water being central to good public health standards. Energy for refrigeration is another aspect. Energy for cooking is another, to alleviate deforestation and improve indoor air quality. All the measures of poverty alleviation through energy and water can increase coping and resilience; thus improve adaptation to climate change; while sending signals to markets for these clean energy technologies. (Paul Epstein, Harvard Medical School)	
E-8-540	A	41	35	41	36	This phrase means that such a solution, to reduce heat stress, is not feasible in many countries, due to lack of sufficient energy generation capacity, etc. Therefore, this last phrase may read better as follows: This solution is impracticable in countries where the energy generation capacities are low". (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-541	A	41	35	41	36	Replace the last sentence of this para weith the following: "While this may not be practical today in many parts of the world, in the future this might become more practical with economic growth, technological progress, and a mass market." Consider, e.g., solar powered fans, etc. (Indur Goklany, US Department of the Interior)	Addressed
E-8-542	A	41	38	41	38	Between "waste water and irrigation", replace "for", instead of "and" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-543	A	41	43	41	44	The sentence, starting with "Irrigation is currently an important determinant in the spread...", is not linked well with the sentence before and the sentence after. Both these sentences discuss the use of wastewater for irrigation, while the sentence in the middle talks about the spread of malaria and schisto through irrigation development (whether using wastewater or river water). In fact, malaria mosquitos and schisto snails may not like the wastewater environment. Rewording may be needed. (Hisashi Ogawa, World Health Organizatin Western Pacific Regional Office)	Addressed
E-8-544	A	41	45			This statement on its own (treatment of wastewater remains unaffordable for low income populations) is the most bald statement. At some level, wastewater treatment is quite affordable (at least to get clean water) and there's a huge amount written about this topic that suggests that the urban poor can be helped here with relatively low cost. If the statement is tied directly to treatment of irrigation water, then I am not qualified to challenge the statement. (Alan Krupnick, Resources for the Future)	Addressed

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E-8-545	A	41	51	42	1	Throughout the preceding pages, it has been clear that there is, to say the least, considerable controversy over the future impact of climate change on vector-borne diseases, not to mention current prevalence and incidence. Indeed, I see many improvements in this draft compared to the first. Nevertheless, in this context of this more balanced approach, the opening statement in the conclusions is misleading to those who have not read the meat of the report (most people will read the Executive Summary and the Conclusion: "PUBLISHED EVIDENCE INDICATES THAT CLIMATE CHANGE IS AFFECTING HEALTH ALREADY THROUGH CHANGES IN THE DISTRIBUTION OF HEALTH-RELEVANT INSECT SPECIES (VECTORS). Published evidence, at the very least, is contested by many, including those best qualified to judge the issue. I sincerely hope that the authors will revise both the Summary and the Conclusions to emphasize the great uncertainties that are inherent in this topic. (Paul Reiter, Institut Pasteur)	Addressed
E-8-546	A	42	1		12	Given the Katrina disaster, I would also add to this list the deaths and injuries associated with storm events related to warmer waters. (Alan Krupnick, Resources for the Future)	Addressed
E-8-547	A	42	3	42	3	Physically wise it shall read " increases in high temperature events", therefore, add events after temperature (in singular) (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-548	A	42	4			insert "that" after "heat waves" (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-549	A	42	4			Before the period (full stop) on line 4, append the following: "unless effective adaptation measures are undertaken in a timely fashion." (Indur Goklany, US Department of the Interior)	Addressed
E-8-550	A	42	8	42	8	For the reasons mentioned above, after malaria add " as well as the infection potential of plasmodia" (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-551	A	42	12			Figure 8.3: There is less to this figure than meets the eye. It could also seriously mislead. First, it's not clear what time period this figure applies to. Assuming it's the future, considering that the majority of impact studies partly or wholly ignore adaptations, the confidence levels attached to the estimates are overblown, as we have noted previously. (Indur Goklany, US Department of the Interior)	Addressed
E-8-552	A	42	14	42	17	Comment: again, strong points made in tying-in climate change impacts to MDGs (Kim Knowlton, Columbia University)	Addressed
E-8-	A	42	19	42	20	the sentences of "recent extreme events showed that populations and health systems	Addressed

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553						are unable to copy with rapidly occurring events" has logistic problem, and it is difficult to understand. The author should think it carefully. (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	
E-8-554	A	42	23	42	25	The health impact overview in Fig 8.3 is excellent. I propose the following modifications/additions: I would argue that an arrow for "increased latitudinal and altitudinal expansion of distribution of VBD" should be added. This said, the issue of impact on VBD diseases is, of course, not captured only by "map" changes. I had made that comment in my first review and do not see in being addressed in the revised text (immunologically naïve populations newly exposed to a disease cannot be counterbalanced in our impact estimates with reduced exposure of hitherto exposed populations). (Rainer Sauerborn, Heidelberg University)	Addressed
E-8-555	A	42	23			Summary of Impacts Fig 8.3 - I very much like what this chart is trying to accomplish. Suggests to me, as per my earlier comment that we should indicating climate change is likely to have overwhelmingly negative impacts on health. However, the chart includes health impacts (cold-related mortality), ecosystem impacts (heat events, floods) and adaptation measures (pressures on disease control activities) which makes it very inconsistent and less useful. E.g., do we have medium confidence that floods will occur from climate change or health impacts from floods will occur etc? (Peter Berry, Health Canada)	Addressed
E-8-556	A	42	23			Figure 8.3 - it's unclear what the length and width of the arrows represents since both magnitude and certainty are mentioned. I would prefer to use probability rather than certainty here. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-557	A	42	25	42	25	The title should read, after Impacts, " due to climate change. This clarification is necessary when reading the table outside of context. It should be also noted that no reference is made of floods and droughts, having an important impact on human health. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-558	A	42	25	42	25	Fig 8.3 - This figure is very clear and an excellent summary (Elsa Casimiro, Inst. D. Luiz, Faculty of Sciences - University of Lisbon)	Addressed
E-8-559	A	42	32			replace 'already existing' with 'pre-existing' (Clair Hanson, IPCC TSU)	Addressed
E-8-560	A	42		42		Fig 8.3 - See previous comment about moving malaria to the medium high confidence category. Could this table not be made more comprehensive by showing the direction and magnitude of all health outcomes referred to in the 4AR	Addressed

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						by adding a low confidence category? It would be good for the reader to get a bird's eye view of the expected impacts at this point in time even if many of these are in a low confidence category. (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	
E-8-561	A	43	1	43	2	Subsistence farmers in flood-prone areas may also be very vulnerable, as may be populations living on the edge of the distribution of vector borne diseases (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-562	A	43	10		11	Any projections of more than a century are simply speculation. No one can have any idea what the world will be like more than 100 years into the future. (Thomas Gale Moore, Stanford University)	Addressed
E-8-563	A	43	13	43	13	After “water”, add “quantity”, so to read “water quantity and quality”. Regarding the word “security it applies to individuals, communities and the environment, therefore, we should say “human and environmental security. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-564	A	43	17	43	45	Expert Review: On the Conclusions; Expert Reviewer suggests that the following description would insert the text. 1) For the development of clean energy in households, it might be important to promote the biogas project in various communities of industrialized countries, developing countries and countries with economies in transition for health risk reduction and mitigation of climate change. (Mitsuru Ando, Toyama University of International Studies)	Addressed
E-8-565	A	43	19	43	21	It is not necessarily true that policies that reduce fossil fuel combustion reduce emissions of co-emitted pollutants. Particle filters on diesel engines may increase NO2 levels for example. There are many other links between transport policy and health, for example, increased use of public transport can reduce emissions and accident rates with consequent benefits for health. Increased cycling and walking can obviously also have beneficial effects on health. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-566	A	43	19		21	Policies that reduce fossil fuel combustion in transportation will make transportation more costly and perhaps slower. One of the gains of having an efficient transportation system is that there is less spoilage and less disease from contaminated foods. So reducing fossil fuel consumption must be considered in terms of its cost to the health of the public. (Thomas Gale Moore, Stanford University)	Addressed
E-8-567	A	43	22			please give examples of these quantifiable benefits (Clair Hanson, IPCC TSU)	Addressed
E-8-	A	43	23	43	24	The phrase relative to the reduction of methane emissions, in connection with	

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568						ozone generation, should, in this particular case, focused on the atmospheric ozone altitudinal distribution affecting most human health. Such is the case of surface ozone. Therefore, since the reference to global concentrations of ozone embrace surface, troposphere and stratospheric ozone, and, in this case the text refers to direct effects on human health, the phrase should refer to surface ozone. (Osvaldo Canziani, IPCC WGII Co-chair)	
E-8-569	A	43	23			has this report been published yet? If so please up date the reference (Clair Hanson, IPCC TSU)	Addressed
E-8-570	A	43	38	43	40	The sustainable harvesting of biomass fuel could in theory have little net impact on climate forcing but currently much of the use is unsustainable. (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-571	A	43	40	43	40	Instead of agricultural practices, it would be better to say “land use practices” since it involves agricultural activities and deforestation. Deforestation is the largest culprit in LA CO2 net emissions. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-572	A	43	40		45	I am very happy to see this reference to co-benefits (Alan Krupnick, Resources for the Future)	Addressed
E-8-573	A	43	43	43	45	Chapters 8 and 9 of the WSG III-TAR provide an excellent reference on national costs and ancillary benefits of mitigation and their sectors ´costs. Since AR4 should aim to provide the best possible information for decision making actions, this reference, plus the necessary clarification, could be useful. (Osvaldo Canziani, IPCC WGII Co-chair)	Addressed
E-8-574	A	43	44			"promotING" is better (Danny Harvey, Dept of Geography, University of Toronto)	Addressed
E-8-575	A	43	48	44	38	This section is a very important one regarding the message to be sent to decision maker, both official and private. In this respect, the first phrase it too general and does not reflect the reality in many developing countries. There are endemic diseases, like the trypanosomiasis (African and American), or spells of dengue and other illnesses which are not reported or are biased. Should decision makers from developing countries read the two first statements, then all the efforts undertaken by local professional (medical doctors, environmentalists, etc) will be lost. It is true that some national communications and the AIACC / GEF and other projects have included some studies on human health; however, the lack of reliable statistics, covering both the weather / climate information and the human health relevant consequent data, is the shortcoming to be solved. Should we look for references on this regrettable situation, a renew action by the CGOS Secretariat, of the WMO, just re-initiate (June 2006) is “fighting” to get the	Partly Addressed

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						<p>developing countries authorities to activate the Regional Action Plans to implement the global climate network which, in the best of the cases will solely include some information on extreme events and their consequences.</p> <p>Generalization of developments mostly registered in developed countries would lead to enlarging the dichotomy between scientists and politicians, in developing regions.</p> <p>The phrase in lines 7 to 9, in page 44, shows what has been mentioned above; however, a word should be said to decision levels. It is suggested to complement this phrase adding, at the end the following: “Urgent action by governments and private groups is necessary to solve these deficiencies.</p> <p>The closing, in lines 36 to 38 should be reinforced by adding:</p> <p>After “monitoring”, in line 36 “warning and alert” so to read : “integrated monitoring, warning and alert systems” In line 37, in view of the above mentioned comments, please replace the word “ advances” by “ state of development” In line 38, after “fashion”, add “with the national disasters prevention and alert bodies, profiting of their communication means and outreaching capacities. The MDGs offer a wide field of action to educate the national and regional communities, formally and informally about health hazards and risk circumstances”.</p> <p>(Osvaldo Canziani, IPCC WGII Co-chair)</p>	
E-8-576	A	43	48	44	38	<p>Research: More emphasis would be desirable to carry out research in developing countries, build structural and human capacities there to do such research, use existing networks (examples are the INCLEN or INDEPTH networks) both for surveillance and for research</p> <p>(Rainer Sauerborn, Heidelberg University)</p>	Not Addressed, because of the risk of excluding one or other network
E-8-577	A	43	48			<p>Research priorities section is very small in section 8.8. Section 8.1.4 p7 includes more information regarding research priorities. Suggest this is moved to section 8.8</p> <p>(Paul van der Linden, Met Office)</p>	Addressed
E-8-578	A	44	3		5	<p>I think that linking health effects to climate change is a relatively easy thing to do, so long as one accepts the linkages from the more immediate endpoints (storms, temperature) to climate change rather than normal variability in weather. I think this should be made clearer.</p> <p>(Alan Krupnick, Resources for the Future)</p>	Addressed
E-8-579	A	44	14			<p>later --> latter</p> <p>(Clair Hanson, IPCC TSU)</p>	Addressed
E-8-580	A	44	17	44	17	<p>improved instead of improve</p> <p>(Yola Verhasselt, Royal Academy of Overseas Services)</p>	Addressed

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E-8-581	A	44	17			improved (Alan Krupnick, Resources for the Future)	
E-8-582	A	44	24	44	25	It should read '...the heatwave in 2003 probably represented an early example...' (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-583	A	44	34			Economic impacts are really an afterthought in this report and deserve more space. (Alan Krupnick, Resources for the Future)	Not Addressed
E-8-584	A	44	36	44	38	This concluding paragraph is weak and needs to have a clearer focus with a few key messages (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-585	A	44	36	44	38	It is unclear who needs to communicate results and through which channels? (Andy Haines, London School of Hygiene & Tropical Medicine)	Addressed
E-8-586	A	44	36	44	38	Comment: Very strong ending/summarizing section on where research priorities point to for future, especially the need for integrated monitoring systems. Monitoring is too frequently underrated & under-funded. (Kim Knowlton, Columbia University)	Partly Addressed
E-8-587	A	57	29	57	29	atmosphere instead of atmopshere (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-588	A	63	14			add "National Climate Center,Chinese Meteorological Administration. 2004. China climate impact assessment in 2003. Beijing: Chinese Meteorological Press. 20p (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Not Addressed???
E-8-589	A	63	36	63	36	synoptic instead of synoptiv (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-590	A	63	40	63	40	aerosol instead of aoeosol (Yola Verhasselt, Royal Academy of Overseas Services)	Addressed
E-8-591	A	68	27	68	28	This paper is published in the Lancet not Lancet Infect diseases as listed (Frank Tanser, Malaria Research Lead Programme, Medical Research Council/ Africa Centre for Health and Population Studies)	Addressed
E-8-592	A	71	45			add " Zhao ZC, Li QQ, Zhao ZQ, et al. 2000. Relationship between ENSO and climate change in China and predictions of ENSO. World Resource Review. 12(2): 276 (Fengjin Xiao, Beijing Climate Center, Chinese Meteorological Administration)	Addressed
E-8-593	A	72	31			Page 72 line 31. The omission of drinking water supply as 'public infrastructure appears odd; the inclusion of 'hygiene' (which is a behaviour, not an infrastructure) also appears odd. (Jamie Bartram, Water, Sanitation and Health Programme)	Addressed

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This part contains LATE EXPERT comments for chapter 8

CHAPTER 8

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8-1	LATE	5	31			The burden of vector borne diseases under communicable disease may also be incorporated as they are likely to be affected most by climate change. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-2	LATE	5	48			it should be : a million children's deaths (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-3	LATE	7				Table 8.1 : to delete (plus 10% area with breeding conditions by 2080) (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-4	LATE	8	15	8	16	Pl add leishmaniases also (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-5	LATE	8				Table-2: burden of Dengue and leishmanises may also be included (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Not Addressed – table deleted
8-6	LATE	12	9	12	10	rise in temperature (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-7	LATE	12				Section 8.2.2 Wind storms and floods (page 12-14) may be shortened. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-8	LATE	21	48	21		Decrease in rainfall has also resulted in epidemics of malaria in Sri Lanka (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-9	LATE	24				Section 8.3 may be expanded. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-10	LATE	30		30		Table 8.4: findings about Malaria, India may also be included in the table based on published work (Bhattacharya et al 2006) (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria	Addressed

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						Research Centre))	
8-11	LATE	42		42		Fig 8.3: does not provide clear cut information. eg Under malaria subhead it is shown as negative impact with medium confidence. It may not be true for different areas. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-12	LATE	44	32	44	34	Under key research activities, emphasis should be laid on prospective studies showing the impact of climate change on disease vectors' density. The areas with recent introduction of disease (hitherto non- endemic due to low temperature) would be most suitable for assessing the impact of climate change. Work is required on Dengue, Leishmaniasis and Japanese encephalitis as well. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Addressed
8-13	LATE	45		72		References may be reduced. (Ramesh Dhiman, National Institute of Malaria Research(formerly Malaria Research Centre))	Not Addressed