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**Citation for published version:**

Sawyer, I, Harden, J & Baruah, R 2023, 'Intensive care clinicians' information acquisition during the first wave of the Covid 19 pandemic', *Journal of the Intensive Care Society*, vol. 24, no. 1, pp. 40-46.  
<https://doi.org/10.1177/17511437221105777>

**Digital Object Identifier (DOI):**

[10.1177/17511437221105777](https://doi.org/10.1177/17511437221105777)

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Peer reviewed version

**Published In:**

Journal of the Intensive Care Society

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# Intensive care clinicians' information acquisition during the first wave of the COVID-19 pandemic

Submitted to Journal of Intensive Care Society 8<sup>th</sup> May 2022

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## Abstract

**Introduction:** The global pandemic caused by novel Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) has led to an unprecedented demand on critical care resources. The United Kingdom experienced its 'first wave' of Coronavirus-19 (Covid-19) disease in Spring 2020. Critical care units had to make major changes to their working practices in a short space of time and faced multiple challenges in doing so, including the challenge of caring for patients in multiple organ failure secondary to Covid-19 infection in the absence of an established evidence base of best practice. We undertook a qualitative investigation of the personal and professional challenges faced by critical care consultants in one Scottish health board in acquiring and evaluating information to guide clinical decision making during the first wave of the SARS-CoV-2 pandemic.

**Methods:** Critical care consultants in NHS Lothian working in critical care from March – May 2020 were eligible to participate in the study. Participants were invited to take part in a one-to-one semi structured interview conducted using Microsoft Teams videoconferencing software. Reflexive thematic analysis was used as the method for data analysis using qualitative research methodology informed by a subtle realist position.

**Results:** Analysis of the interview data generated the following themes: The Knowledge Gap; Trust in Information; and Implications for Practice. Illustrative quotes are presented in the text and thematic tables

**Discussion:** This study explored the experiences of critical care consultant physicians in acquiring and evaluating information to guide clinical decision making during the first wave of the SARS CoV2 pandemic. This study revealed that clinicians were profoundly affected by the pandemic and the ways in which it changed how they could access information to guide clinical decision making. The paucity of reliable information on SARS-CoV-2 posed a significant threat to the clinical confidence of participants. Two strategies were adopted to ease mounting pressures – an organised approach to data collection and the establishment of a local community of collaborative decision-making. These findings contribute to the wider literature by describing health care professionals' experiences in unprecedented times and could inform recommendations for future clinical practice. This could include governance around responsible information sharing in professional instant messaging

groups, and medical journal guidelines on suspension of usual peer review and other quality assurance processes during pandemics.

## Introduction

The global pandemic caused by novel Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) has led to an unprecedented demand on critical care resources. The United Kingdom experienced its 'first wave' of Coronavirus-19 (Covid-19) disease in Spring 2020. Critical care units had to make major changes to their working practices in a short space of time and faced multiple challenges in doing so, including the challenge of caring for patients in multiple organ failure secondary to Covid-19 infection in the absence of an established evidence base of best practice.<sup>1</sup>

The time course associated with usual routes for dissemination of information, such as peer reviewed journal articles, did not align with the speed of progression of the pandemic, and novel routes for dissemination of information emerged early in the first wave. These included open access webinars hosted by national and international critical care societies, rapid-access online publications on journal websites, and information sharing using social media platforms and instant messaging apps, which also allowed the mass sharing of protocols and other documents.<sup>2,3</sup> The quality and accuracy of this information was variable. <sup>4,5</sup>

In the first wave of the pandemic the pathophysiology of Covid-19 disease had not yet been well described, and effective treatments had not yet been developed, potentially leading to an increased likelihood of reliance on accumulated personal experience and anecdotes from colleagues.<sup>6</sup>

The combination of rising case numbers, clinical uncertainty, and rapid increase in non-traditional routes of information dissemination driven by the time-critical nature of the pandemic, placed a burden on clinicians to acquire and evaluate this information to guide patient management.

We undertook a qualitative investigation of the personal and professional challenges faced by critical care consultants in one Scottish health board in acquiring and evaluating information to guide clinical decision making during the first wave of the SARS-CoV-2 pandemic.

## Methods

Critical care consultants in NHS Lothian working in critical care from March – May 2020 were eligible to participate in the study. Ethical approval was granted by the University of Edinburgh Medical School Research Ethics Process. As this was a study involving NHS staff in Scotland, NHS research ethics was not deemed necessary by the NHS Health Research Authority. Participants were recruited by email in October 2020 and January 2020, and through chain sampling techniques, and invited to take part in a one-to-one semi structured interview (conducted by IS). The interviews were loosely structured by a topic guide that focussed on participant experience during the first wave of the pandemic. We adopted a

qualitative methodology, informed by a subtle realist position, because of the flexibility and openness it offered to explore the views and experiences of the participants.<sup>7</sup>

Interviews were conducted using Microsoft Teams videoconferencing software and were audio recorded and transcribed by IS. We used a pragmatic approach to decide how many interviews to conduct, guided by the concept of information power.<sup>9</sup> The experience and knowledge possessed by participants were highly specific for the aims of the study and therefore this sample was likely to have high information power. Given the scope of the project (an undergraduate Special Study Component module) we aimed to recruit 6-8 participants.

The interviewer adopted a reflexive approach to data collection,<sup>10</sup> evaluating the efficacy of the topic guide in guiding the conversation and modifying as appropriate as data collection progressed. Only minor modifications were required. Thematic analysis was used as the method for data analysis.<sup>11,12</sup> This followed a recursive, six-stage approach of initial data familiarisation, generation of codes, initial theme generation, development and revision of themes, refining and naming themes and writing of the final report

Following a period of familiarisation with the dataset, the primary investigator (IS) systematically identified and named concepts (codes) within the dataset relevant to the research question. Each code and the data extracts relating to it were stored in a spreadsheet database (Microsoft Excel 365). After the whole dataset was coded, codes were grouped together to reflect patterns of shared meaning that had been identified during the coding process (themes and sub themes). The themes were named, and were refined by referring back to the code list and the original dataset over the course of the analytic process to ensure themes and sub themes reflected the content of the dataset.

The research team (IS, RB, JH) regularly met to discuss developing themes, to consider their relevance to the data as a whole and to develop a narrative that aligned with the data. A reflexive approach was applied to the development of themes and sub themes, acknowledging the subjective nature of the process of data generation and interpretation, for example, the different professional roles of members of the research team and the effects this had on their generation and interpretation of the data.

## Results

Seven consultants from two ICUs in NHS Lothian registered interest and proceeded to interview. Six consultants were male. Three participants practised solely in critical care medicine; three also had regular clinical sessions in anaesthesia and one in critical care and prehospital emergency medicine. All participants had been in post for at least 5 years at the time of interview.

Analysis of the interview data generated the following themes: The Knowledge Gap; Trust in Information; and Implications for Practice. Illustrative quotes are presented in the text and thematic tables.

Table 1. Themes and subthemes.

## The knowledge gap

### Fear and foreboding

All participants described the absence of an established evidence base in the early stage of the pandemic as challenging. Clinicians had to make treatment decisions without the usual reassurance of established standards of treatment, a stark contrast to the 'normal standard'[UPN 7] of practice. As the first wave progressed, the increasing burden of Covid-19 on critical care capacity led clinicians to question how ICU service provision should be organised and attempt to predict who would benefit from different types of treatment. As a result, clinicians reported increasing levels of anxiety that formed a 'tidal wave' of 'fear and foreboding' [UPN 7].

### Not knowing what we don't know

Participants reflected on the contrast between the early and later stages of the first wave, as information about Covid-19 increased at a rapid rate. One participant commented that during the earliest stage of the first wave 'in a way you kind-of benefited from the paucity of information' [UPN 6] as it allowed clinicians to treat patients with Covid-19 disease using pre-existing, standard clinical principles. As the first wave progressed, the significance of the knowledge gap increased, with one clinician commenting that it was 'not knowing what we didn't know' [UPN 4] that disturbed them. Whilst uncertainty was reported to be familiar within pre-pandemic practice, the multitude of unknown variables relating to SARS-CoV-2 felt overwhelming.

### Quest for the answer

Participant responses often returned to the importance of finding relevant information that would further their understanding of the disease and enhance their clinical practice. Some described a 'quest for the answer' [UPN 3], while others developed patterns of behaviour such as checking the numbers of Covid-19 cases on the news and social media daily. One participant described concerns about the degree of 'confirmation bias' [UPN 3] that could be associated with this behaviour.

## Trust in information

### Experiential knowledge-filtering the noise

In the absence of established best practice in the management of Covid-19, participants gave increased importance to the experiential knowledge of others; this was an important source of information, with some participants narrowing their sources of information to the experiences of clinicians with experience of managing the disease. Anecdotes from colleagues from other specialties allowed clinicians to adapt their practice by 'acting on emerging evidence that was not always evidence-based' [UPN 1] such as increased thromboprophylaxis in SARS-CoV-2 patients.

Limitations of experiential knowledge were raised by participants, who felt they could not extrapolate findings from the published studies of small cohorts of Covid-19 patients, as 'if

it's based on "I've seen ten patients and four have got this" then that's not really that helpful' [UPN 1]. Initial publications, such as those from Northern Italy, were thought to have 'produced more fear than [...] useful information' [UPN 2] as they were published rapidly and predominantly reported anecdotal experience.

Clinicians also turned to social media and instant messaging apps for information. National Whatsapp groups brought together clinical leads from ICUs around the country and were used to develop local protocols based on national and international experience. These were also reported by participants as being subject to 'noise' as clinicians were 'reporting what they were seeing, unfiltered' [UPN 2] as well as sharing information found elsewhere.

#### Provenance of information

As more published research and guidance began to emerge, participants reported the challenges of trusting information, based on provenance and perceived quality.

Information sources reflected the geographical evolution of the pandemic with a 'handful of published papers' [UPN 6] from China being replaced by 'word-of-mouth' [UPN 6] from Italy and finally reports from the UK. Some participants declared a preference for information from Europe as their healthcare systems and practice bore greater similarity to Scotland. This was superseded by reports from London that had a 'NHS context' [UPN 2] which participants perceived as having greater insight into the organisation of care in NHS hospitals. Participants reported that professional bodies such as the Faculty of Intensive Care Medicine and Intensive Care Society were quick to organise and respond to the pandemic, and facilitated the dissemination of information on the national experience. However, several participants reported this guidance to be 'hindering' [UPN 6]. For example, NHS England PPE guidance considered Covid-19 to be a 'high consequence infection' [UPN 2] and therefore included additional PPE recommendations including hoods and boots. This led to a lack of alignment with guidance from Health Protection Scotland and the Intensive Care Society. One participant commented that 'if professional bodies are at odds with each other, that for the individual clinician is really difficult' [UPN 3].

#### Quality of published research

Participants differed in their attitudes towards pre-publication articles as a source of information. Whilst some were concerned that they were likely to be 'less scrutinised' [UPN 2] than usual standards of evidence, others thought that journals' ability to 'fast-track' information was valuable even if papers were not as 'polished' or 'more difficult to dig into' [UPN 3].

Participants expressed apprehension about the quality of the information available. The decision by major journals to expedite publications was challenged by several participants, one of whom stated that 'the quality of evidence that was being published was not to the usual standard that you would expect to see in prestigious journals' [UPN 5]. Some participants believed that reporting on small numbers of patients in observational studies was likely to be population specific, thus of limited use. One participant expressed concerns that the usual 'nice safeguards in an editorial process' [UPN 4] including peer review, were sacrificed to share information more quickly.

Other participants felt that ‘as an individual you were being left to try and filter the noise from the actual stuff that might be helpful’ [UPN 4] with one participant describing ‘trawling through’ publications [UPN 3]. Clinicians reported turning to the pre-existing local journal club to evaluate publications with fellow critical care physicians within South-East Scotland. Several participants cited discussions at this meeting becoming their highest level of evidence.

## Implications for practice

### Defensive practice

Many participants cited waiting for SARS-CoV-2 to reach the UK as the worst part of the first wave. In the earliest parts of the first wave, reports of Italian hospitals becoming overwhelmed with patients influenced participants’ clinical decisions, including who to admit to ICU. One participant described the ‘angst’ surrounding admission criteria and another hoped that this would not have a lasting effect on relations between ICUs and other departments in the hospital. Participants expressed fears over their personal accountability for management decisions, including fears of being accused of medical negligence for refusing admissions. Fears were abetted to a degree by practising collaborative decision-making, where decisions whether to admit a particular patient was made after discussion with critical care consultant colleagues.

### Collaborative decision making

Participants described the need for collaborative decision-making in the throes of the pandemic. One participant commented that they were ‘a small cohesive group’ [UPN 4] whilst another said that they were a ‘group brain’ [UPN 2]. Sharing decisions was felt to lend support and confidence to colleagues; they were ‘speaking as a team’ [UPN 2]. One participant believed that it made decision-making clearer rather than a product of one’s own biases; “The decision-making process is clear. It’s not just your opinion that might be influenced by certain biases, it’s the opinion of two or three colleagues” [UPN 6]. Some felt that evaluating emerging evidence in journal club or on Whatsapp groups mimicked the peer-review process, and helped build a developing local observational evidence-base.

### Local considerations

Participants described ways in which their practice during the first wave differed from strategies discussed in national communications. National guidance was largely based on the London experience and some participants reported concerns that guidance such as was not appropriate their own ICU. Participants felt they were able to defend deviations from this guidance through local group consensus.

### Emotional response – difficulty ‘switching off’

The emotional burden of the pandemic had significant implications on practice. Some participants reported that concerns for their own health and logistical work/life concerns, ran alongside those for their patients. Others described the all-consuming nature of working through the pandemic, and the difficulties they faced trying to switch off. This was exacerbated by the limitations of national lockdown restrictions when not at work.



Some participants described how early Italian reports were of little use other than to instil fear, while others cited the positive influence of these reports on early management plans. One clinician reflected that the knowledge gap was heightened by the emotional uncertainty surrounding the unfolding pandemic, commenting that 'now [nine months later] we're in a far more controlled situation we're relying on information in a more kind of traditional way, waiting for a document to come out for example' [UPN 2].

## Discussion

This study explored the personal and professional challenges faced by critical care consultant physicians in acquiring and evaluating information to guide clinical decision making during the first wave of the SARS CoV2 pandemic.

This study revealed that clinicians were profoundly affected by the pandemic and the ways in which it changed, in a very short space of time, the ways in which they could access information to guide clinical decision making. For some individuals, feelings of anger and frustration manifested as an obsessive fixation on Covid-19. This profound emotional response of clinicians to Covid-19 described here has been described as a significant finding elsewhere.<sup>1,13</sup> Participants also reported a state of heightened responsibility, with colleagues and individuals outside the hospital turning to them for information and guidance. This, alongside emotional distress, ought to be recognised as important risk factors for burnout, the incidence of which has been reported to be higher amongst clinicians working in intensive care than other medical specialties.<sup>14</sup>

Two strategies were adopted to ease mounting pressures – an organised approach to data collection and the establishment of a local community of collaborative decision-making. As journals were perceived to be forfeiting reliability for speed, participants described limiting their range of sources of information and being more deliberate in sharing information with colleagues. This approach to information acquisition seemed to provide some reassurance to participants by giving some local standardisation to clinical decision making until trials of therapies for Covid-19 were able to report their findings.<sup>15</sup>

The paucity of reliable information on SARS-CoV-2 was perceived as a significant threat to the clinical confidence of participants. To be critical of emerging evidence, whilst limiting the responsibility facing individual clinicians, clinicians felt it was important to reach a local consensus with colleagues on treatment decisions. This approach to decision-making in intensive care was already an established part of local practice but became even more crucial to participants in the first wave of the pandemic .<sup>16</sup>

Participants were forced to question their role as intensivists, scientists and members of society. In the face of extreme adversity clinicians were able to endure by creating a culture of resilience and shared responsibility. Whilst clinicians must possess a degree of individual resilience, the importance of structural resilience has been highlighted in other qualitative studies. <sup>1</sup> Structural resilience strives for a setting that enables clinicians to face challenges by equipping them with appropriate resources to support their practice and wellbeing as required, thus ought to be a priority within ICUs.

The timing of the interviews is significant to these findings as clinicians were able to reflect on their practice eight to eleven months after the early stages of the pandemic, having been through a period of relative stability in ICU admissions.<sup>17</sup> By the time of interview the publication of several major trials, such as evidence in favour of the use of dexamethasone in Covid-19 patients,<sup>18</sup> had given participants a sense of confidence in their practice that had been missing in the first wave. The commitment of participants to scientific research amidst the pandemic demonstrated their faith in evidence-based medicine and gives further insight into the degree of discomfort they endured in the absence of it.

These findings contribute to the wider literature by describing health care professionals' experiences in unprecedented times. They also challenge the role of professional bodies as a source of guidance and support to clinicians, and describe the importance of local support and collaborative decision making in times of uncertainty. This study could also be used to inform recommendations for clinicians about information acquisition, particularly online, as there is an increasing tendency towards this mode of information acquisition.<sup>19</sup>

This study is limited by only considering the experiences of intensive care consultants. Further interviews with a spectrum of healthcare professionals would add valuable perspective to the wider experience. The consultant participants were also drawn from a single NHS board in Scotland, and reflects their experiences within their organisation, which may not be reflective of the experiences of those working in other NHS Boards or Trusts, or of those working outside of the United Kingdom.

Whilst these findings may not be generalisable they could inform recommendations for future clinical practice. This could include governance around responsible information sharing in professional instant messaging groups, and medical journal guidelines on suspension of usual peer review and other quality assurance processes during pandemics.

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Table 1 Themes and Subthemes

Theme	Subtheme	Extract	Quote	UPN
1. The Knowledge Gap	1.1 Fear and foreboding	1	And as an intensive care clinician if you're going to be treating something that you don't know how to treat that's going to be quite anxiety-inducing	6
		2	There was this sense that there was this tidal wave coming towards us and of an illness that you'd never managed before. And it was actually quite frightening and actually, I haven't admitted it myself, there was a deep sense of fear and foreboding, ah, about what was about to happen to us both professionally and personally	7
	1.2 Not knowing what we didn't know	3	This was a new disease, so we knew what it was, eh, there was uncertainty because it was new and we hadn't dealt with it before, em, whereas other times we might be dealing with- the uncertainty might be that we haven't actually been able to diagnose the person.	4
		4	as far as like, how we manage the disease, we didn't really know anything. Which was kind-of refreshing in a way, scary but refreshing.	6
	1.3 Quest for the answer	5	I joined one [webinar] from the European Society of Intensive Care Medicine, it went on for an entire day [...] on a Saturday, the only day that I had off, you know I didn't listen to the whole thing.	1
		6	I would regularly listen to the news just to get a feel of the pandemic and numbers but you were also working constantly	1
	2. Trust in Information	2.2 Experiential knowledge	7	Reliability is crucial really. And I think we simply had to listen to

			the people who had essentially been there and done that and had the most experience of any of us of treating a new and emerging respiratory virus but there was-, we were almost drowning in information.	
		8	I think what was happening was there were so many [pause] places producing information it was that idea of how on Earth do you kind-of bring that all together to something that makes, makes a bit of sense [...] there was just so much stuff, it almost felt that as an individual you were being left to try and filter the noise from the actual stuff that might be helpful	4
		9	Sometimes [the national Whatsapp] was very different from the media reports, um, so that was. . and I, I needed that information because I could disseminate it to everyone else. I was kind of conscious that within our intensive care I was the only person getting that information, so it was important for me to read it	2
		10	you know we got information overload because suddenly you had, eh, I had Twitter, I had Whatsapp – which was basically everything that had been posted on Twitter in the past 24 hours reposted by colleagues. I have to say I found the national organisation websites were functioning almost like social media as well actually just kind-of “Let’s just get anything up there as quickly as possible”.	4
	2.2 Provenance of information	11	So I do think [the Italian experience] was something that was useful to know but did probably slightly impact on the way we treated people at the	1

			beginning and also, um, there was a difference in the patients that we were seeing because everybody was being treated coming into hospitals in Italy and we were asking people to stay at home and so patients were coming in at different stages of the diseases compared to what we were expecting at the start.	
		12	I think that when you get hit by the pandemic you have to look at anything that's available, because you have no experience of a new disease. So I think you have to look to get some degree of preparedness from what you can see	1
		13	everybody pretty much who was a consultant is a member of the Faculty of Intensive Care Medicine and they were sending out, um, bulletins about experience throughout the country. So, so largely from what was happening in London, because London was one of the first places in the UK to get hit first.	1
	2.3 Quality of published research	14	you really lose the reliability through speed as well. And people, who would normally, who would normally take quite a long time to get an observational- even an observational cohort study through, to get decent numbers of patients in it, to- and to do the stats properly and to draw proper conclusions from it, um, people were putting out a lot of information that hadn't gone through this more robust process. Putting out very [pause] very quick but poor-quality research.	5

		15	a lot of the journals waived the, the normal submission and peer-review process and allowed publication of small cohort studies of patients with this new and emerging respiratory virus as a, as a way of getting information out there from people that have experience of treating. And that started with China and then progressed to Italy and Spain as well, who were publishing, essentially publishing their experience managing these patients. But again, it was small, small numbers of patients and observational cohort studies so you have to take it with a degree of a pinch of salt	5
		16	and I think, just again, clearly because the sheer quantity of research as it came and on relatively smaller numbers, um, that you had to get an overview because that could've been so population specific that it was irrelevant to my practice	3
		17	Every week the New England Journal was full of these Covid things and you thought, they've not been properly kind-of peer-reviewed, it's just another case-series of stuff and it wasn't very helpful.	4
3. Implications for Practice	3.1 Defensive practice	18	We were worried about the ICU being fully overwhelmed so there were a lot of discussions about who we would admit to our ICU, and there were a lot of discussions around about that.	2
		19	in the early days, we were desperate for there to be something about this new disease process. And yes, it's got its nuances and yes, it's a very interesting if not tragic disease that we've been	3

			through, but actually from an intensive care perspective – nuances yes, but ultimately, it's another viral pneumonitis and a lot of what we do has a lot of similarities to other viral pneumonitises	
	3.2 Collaborative decision making	20	we did a lot of cross-site working and having meetings and, and you know, quickly trying to sift through this and actually what was, eh, what was very good was actually having that sort-of, um, almost having our own sort-of peer-review	4
		21	the Scottish Critical Care Delivery Group which it senses, it is a group of intensive care medicine consultants like the equivalent of the clinical lead in every hospital ICU throughout Scotland had a Whatsapp group and were sharing information and advice through the Whatsapp group	1
		22	There will be a spectrum of staff members, some want all the information some want less – you have to kind-of plough a middle ground. And fundamentally we took the view that you could always turn your Whatsapp off. Erm, but it, as the pandemic went on we tried to give people definitive information but the problem was that the information changed so frequently	2
	3.3 Local considerations	23	I think that the hardest decision that certainly as a group of consultants in the Western we had was should we stick with doing what we're good at which is giving high-flow nasal oxygen and CPAP, whereas for the first two-to-three weeks we were just ventilating everybody that came through the front door of intensive care. And	6



			that, that felt weird because we, we were like should we be doing this whereas nearly every other body such as NICE, the Intensive Care Society, NHS England was saying we shouldn't be doing these things – the risk of nosocomial spread is really, really high, there's no benefit – so don't do it. Whereas we felt actually as a group, we're good at this – this feels wrong.	
		24	If you have a large number of people on high-flow nasal, say four or five patients in an intensive care unit, that can create critical problems with your flow of oxygen. So, it wasn't only a clinical reason why you'd consider putting people on high-flow with the infectious spread, aerosolization, but also were we going to run into problems of oxygen consumption	6
	3.4 Emotional response	25	When I closed my eyes at night I was thinking about COVID. The whole day I was thinking about COVID. I think that's just the way it was. It was very, very. . . in terms of home life, when you went home it was very, very difficult to switch off.	2
		26	And it's tough because I can think of some of the patients who died early on, who [slow] we could've had a better shot at treating now, but I mean that, that is just life.	2
		27	You were focused, totally focused on one disease and about how you could do your best with a new disease and many patients whose lives were dependent on the right management for this	1

			disease and you didn't know what you were going to do at the beginning.	
		28	you have to make sure that you learn and you take it into the next patient, and you, you know, what you can, you can, you can't go back and change what's already happened I guess	2