



Garda Síochána Analysis Service

**The impact of GISC's MAT/MIT checkpoint  
recording practices on the number of  
breath tests recorded on PULSE**

GSAS\_V4\_FINAL

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## Contents

1. Introduction.....	2
2. Data cleaning steps.....	4
a. Final data files.....	5
3. Findings.....	6
4. Overall MAT/MIT checkpoint compliance with the rule.....	10

## **1. Introduction**

As part of the MAT/MIT examination conducted by An Garda Síochána, we analysed audit files for the first 6 months of 2012 for the MAT/MIT checkpoints that had at least one record with a “Review Type” of

- No review needed;
- Review required;
- Reviewed;
- Reviewed/Clarification<sup>1</sup>.

This analysis was as a result of the visit to the Garda Information Services Centre (GISC) in April 2017, during which it emerged that there was confusion between GISC and Garda members over the recording of information in the fields under the “MIT Statistics” tab on PULSE. We learned that when entering MAT/MIT checkpoints on PULSE, GISC applied the rule that the number of negative, positive and failed/refused breath tests should add up to the number of vehicles stopped and controlled<sup>2</sup>. However, the figures reported or entered in those fields by the members did not always add up. Where this was the case, checkpoints were flagged for review, and figures were updated as per the rule. For example, if the number of vehicles stopped and controlled entered was 10, and the negative, positive and failed/refused breath tests added up to 5, either the number of negative breath tests was increased by 5 to match the number of vehicles stopped and controlled, or the number of vehicles stopped and controlled was reduced by 5 to match the number of breath tests. We hypothesised that if the former recording practice was more prevalent, this might have led to the inflation of breath tests, particularly negative breath tests, on PULSE.

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<sup>1</sup> There are 6 review statuses available on PULSE: “New”, “No Review Needed”, “Review Required”, “Reviewed”, “Reviewed by System”, “Reviewed/Clarification”. Checkpoints marked as “Reviewed/Clarification” were the most relevant to our analysis. However, we also included checkpoints flagged as “No Review Needed”, “Reviewed” and “Review Required” (that is, checkpoints that needed manual review) for completeness sake.

<sup>2</sup> After the completion of this analysis, we learned that, according to GISC, they only started applying this rule in November 2012, when the instruction to do so was added to their manual (GISC Manual 2012). In April 2016, the “MIT Checkpoint Details” check box with this instruction was also added to PULSE.

The aim of the analysis was to investigate how this rule was applied day-to-day, and how, if at all, it affected breath test recording on PULSE. We posed the following questions:

- **If the number of breath tests and vehicles stopped and controlled did not match, did GISC update the figures as per the rule?**
- **If so, how were the numbers updated? That is, did GISC adjust the number of breath tests to match the number of vehicles stopped and controlled, or change the number of vehicles stopped and controlled to match the number of breath tests?**

The audit data were supplied by the Information Analysis Service (IAS). We requested the data for the first 6 months of 2012, as it was not possible to investigate all checkpoints that were reviewed between 25 July 2010, when vehicles stopped and controlled field was first introduced on PULSE, and 10 April 2017<sup>3</sup>. We felt that a 6-month sample would be sufficient to identify any patterns. The year 2012 was selected as a 'typical' year, when GISC's recording practices were well embedded<sup>4</sup>.

It is important to note that any changes to the records in our sample are not directly attributable to the review process. For example, we cannot be certain that an update to the number of negative breath tests to match the number of vehicles stopped and controlled was as a result of a review instruction. PULSE incidents can be reviewed and changed by a member at any time, without a specific instruction being given. However, considering the nature of the sample, it is highly probable that changes to the figures were made following the review.

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<sup>3</sup> 10 April 2017 was the cut-off date for this enquiry.

<sup>4</sup> In hindsight, 2012 was not a 'typical' year. As outlined in footnote 2, having completed the analysis, we learned that, according to GISC, they started applying the instruction that the number of vehicles stopped and controlled should equal the sum of negative, positive and failed/refused breath tests only in November 2012.

## **2. Data cleaning steps**

We received 6 data files from IAS, one for each month. Each file contained multiple rows for each checkpoint, one for each change to the record.

The following steps were performed on each file before conducting the analysis:

1. The IAS query did not exclude invalidated checkpoints; therefore, they had to be removed manually. As the data files supplied did not contain the information on whether the checkpoint was valid or not, a query was run in i2 to obtain the “invalid” status for each checkpoint for each monthly file. I2 extracts were entitled “Month1InvalidIndicator”, “Month2InvalidIndicator”, etc.
2. Checkpoints with “Invalid Indicator” = “I” were deleted.
3. Records with blank dates in the “Updated” column (“01/01/1000 00:00:00”) were also deleted to reduce the size of the files. In the majority of cases, the date was recorded as blank in the rows indicating the creation of the incident on PULSE. In such cases “Updated” date is irrelevant and hence recorded as blank. Thus, it was safe to delete these rows. However, there were a number of checkpoints where all review instances for the checkpoint contained blank dates in the “Updated” column<sup>5</sup>. These records should not have been deleted. The affected checkpoints were checked and added again into the monthly files.
4. The monthly files were then sorted by “Incident No” and “Chk Ver No” (ascending), and the latest record for each checkpoint was identified using formulas.
5. Next, checkpoints for which the figures under the “MIT Statistics” tab had changed were identified using formulas.
6. Checkpoints marked as “CHECK” in the “RECORDS TO CHECK” column were then checked manually.
  - a. Checkpoints where the figures in the vehicles stopped and controlled, vehicles through a checkpoint or any of the breath

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<sup>5</sup> According to IAS this was caused by a bug.

test fields had changed from zero to another number were marked as green.

- b. Checkpoints where the figures in the vehicles stopped and controlled, vehicles through a checkpoint or any of the breath test fields had changed from one number to some other number were marked as red.
  - c. For the latter, the difference in the number of breath tests before and after the change was calculated.
  - d. Checkpoints were also coded to indicate whether the changes had been made during the same user session or at a later stage, most likely following a review. For example, checkpoints where the number of breath tests had been updated to match the number of vehicles stopped and controlled within seconds were coded as “Same time”. Checkpoints where the change had occurred hours or days later were coded as “Not same time”. Only the latter were of interest for the purposes of this analysis.
  - e. It was also noted whether the checkpoint had been updated by the same or different person.
7. Finally, a calculation was performed to check whether the checkpoints in the sample, overall, complied with the rule that the number of vehicles stopped and controlled should equal the number of negative, positive and failed/refused breath tests.

#### ***a. Final data files***

The final number of valid checkpoints in each monthly file was as follows:

- **Month 1 (Jan):** 6,729 checkpoints (1,264 checkpoints were invalid and a further 23 should have been invalidated and thus were deleted from the file).
- **Month 2 (Feb):** 5,949 checkpoints (1,087 checkpoints were invalid and a further 22 checkpoints should have been invalidated and thus were deleted from the file).
- **Month 3 (Mar):** 6,520 checkpoints (992 checkpoints were invalid and a further 7 should have been invalidated and thus were deleted from the file).
- **Month 4 (Apr) –** 6,069 checkpoints (1,071 checkpoints were invalid and a further 20 should have been invalidated and thus were deleted from the file). One of the checkpoints (8844916) had 8,741 refused

breath tests recorded (vehicles stopped and controlled was 3, negative breath tests also 3), which were changed to zero 16 minutes later. This checkpoint was not included in the analysis in order not to skew the results.

- **Month 5 (May):** 6,316 checkpoints (980 checkpoints were invalid and a further 46 should have been invalidated and thus were deleted from the file).
- **Month 6 (Jun):** 5,087 checkpoints (1,467 checkpoints were invalid and a further 29 should have been invalidated and thus were deleted from the file).

The total number of valid checkpoints in all 6 files was **36,670**.

### **3. Findings**

**Table 1** shows that 81% of the checkpoints in our sample complied with the rule that the number of vehicles stopped and controlled should be equal to the sum of negative, positive and failed/refused breath tests.

Analysis of the checkpoints where the figures in the vehicles stopped and controlled, vehicles through a checkpoint or any of the breath test fields had changed shows that of the 36,670 checkpoints in our sample, 2,707 had been affected (7%) with the number of updates equalling to 2,824 (some checkpoints had more than one update in the outlined fields) (see **Table 2**).

We were only interested in the updates where the figures had changed from one number to some other number (1,024 instances). Of the 1,024 updates of interest, 743 (73%) were related to applying the rule. That is, either the figures in the vehicles stopped and controlled field or breath test fields had been changed to match. A further 281 updates (27%) were not rule related.

It is important to distinguish between the changes that had occurred during the same user session and at a later stage, most likely following a review. We were only interested in the latter, of which there were 590 instances in our

sample. The net change in the number of breath tests as a result of applying the rule was +1,026 breath tests or 0.42% (**Table 3**). That is, had the changes to match the number of vehicles stopped and controlled and breath tests not been made, there would have been 244,374 breath tests recorded on MAT/MIT checkpoints on PULSE in the first 6 months of 2012 as opposed to the current figure of 245,400.

In the majority of instances where the rule had been applied (in 457 out of 590 cases or 77%), it was the number of vehicles stopped and controlled that was updated (in most cases reduced) to match the number of breath tests, and not the other way around.

Thus, based on this analysis, we can conclude that the inflation of breath test figures as a result of matching the numbers between the vehicles stopped and controlled and breath test fields in the first 6 months of 2012 was negligible.



**Table 1: Sample's compliance with the rule that the number of vehicles stopped and controlled should equal the number of negative, positive and failed/refused breath tests**

	Jan 2012		Feb 2012		March 2012		Apr 2012		May 2012		Jun 2012		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
<b>Total No. of checkpoints</b>	<b>6,729</b>	<b>100%</b>	<b>5,949</b>	<b>100%</b>	<b>6,520</b>	<b>100%</b>	<b>6,069</b>	<b>100%</b>	<b>6,316</b>	<b>100%</b>	<b>5,087</b>	<b>100%</b>	<b>36,670</b>	<b>100%</b>
Checkpoints that comply with the rule	5,465	81%	4,924	83%	5,238	80%	4,844	80%	5,079	80%	4,129	81%	<b>29,679</b>	<b>81%</b>
Checkpoints that do not comply with the rule	1,264	19%	1,025	17%	1,282	20%	1,225	20%	1,237	20%	958	19%	<b>6,991</b>	<b>19%</b>

**Table 2: Checkpoints where the numbers had changed**

	Jan 2012		Feb 2012		March 2012		Apr 2012		May 2012		Jun 2012		Total	
No. of checkpoints	6,729		5,949		6,520		6,069		6,316		5,087		36,670	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
<b>Times numbers changed</b>	<b>442 (430 chkpoints)</b>	<b>100%</b>	<b>387 (374 chkpoints)</b>	<b>100%</b>	<b>424 (406 chkpoints)</b>	<b>100%</b>	<b>492 (475 chkpoints)</b>	<b>100%</b>	<b>531 (507 chkpoints)</b>	<b>100%</b>	<b>548 (515 chkpoints)</b>	<b>100%</b>	<b>2,824 (2,707 chkpoints)</b>	<b>100%</b>
<i>Changed from 0 to another number</i>	296	67%	284	73%	246	58%	335	68%	312	59%	327	60%	1,800	64%
<i>Changed from one number to another</i>	146	33%	103	27%	178	42%	157	32%	219	41%	221	40%	1,024	36%
<b>Times numbers changed to follow the rule</b>	<b>102</b>	<b>100%</b>	<b>57</b>	<b>100%</b>	<b>132</b>	<b>100%</b>	<b>110</b>	<b>100%</b>	<b>161</b>	<b>100%</b>	<b>181</b>	<b>100%</b>	<b>743</b>	<b>100%</b>
<i>Change was made during the same session</i>	28	27%	19	33%	30	23%	25	23%	26	16%	25	14%	153	21%
<i>Change was made later</i>	74	73%	38	67%	102	77%	85	77%	135	84%	156	86%	590	79%
<b>Times numbers changed for another reason</b>	<b>44</b>	<b>100%</b>	<b>46</b>	<b>100%</b>	<b>46</b>	<b>100%</b>	<b>47</b>	<b>100%</b>	<b>58</b>	<b>100%</b>	<b>40</b>	<b>100%</b>	<b>281</b>	<b>100%</b>
<i>Change was made during the same session</i>	33	75%	34	74%	35	76%	31	66%	28	48%	19	48%	180	64%
<i>Change was made later</i>	11	25%	12	26%	11	24%	16	34%	30	52%	21	53%	101	36%

**Table 3: Additional breath tests as a result of applying the rule**

	Jan 2012	Feb 2012	March 2012	Apr 2012	May 2012	Jun 2012	Total
<b>Total No. of breath tests</b>	<b>42,337</b>	<b>38,410</b>	<b>43,663</b>	<b>41,488</b>	<b>44,110</b>	<b>35,392</b>	<b>245,400</b>
Additional number of breath tests as a result of applying the rule, when change was made later	196	242	144	159	158	127	1,026
Proportion of additional breath tests as a result of applying the rule, when change was made later	0.47%	0.63%	0.33%	0.38%	0.36%	0.36%	0.42%

#### **4. Overall MAT/MIT checkpoint compliance with the rule**

Our analysis shows that 81% of the MAT/MIT checkpoints recorded on PULSE in the first 6 months of 2012 complied with the rule that the number of vehicles stopped and controlled should be equal to the sum of negative, positive and failed/refused breath tests. The compliance rate of all MAT/MIT checkpoints recorded on PULSE in 2012 was 87% (**Table 4**).

Table 4 shows that compliance with the rule increased to 98% in 2013 and has remained consistently high since. According to GISC, they started to apply the rule only in November 2012. This could explain lower compliance rates between 2010 and 2012. On the other hand, compliance rates between 78% and 87% over the 2010 - 2012 period would indicate that the rule was applied, albeit perhaps less consistently. Our analysis of the first 6 months of 2012 confirms this, as it showed that GISC had changed figures in the vehicles stopped and controlled/breath test fields for a number of checkpoints in our sample to make them match prior to November 2012.

**Table 4: Compliance with the rule that the number of vehicles stopped and controlled should equal the sum of negative, positive and failed/refused breath tests, 2010-2017**

	Year								Total
	2010*	2011	2012	2013	2014	2015	2016	2017*	
Checkpoints that do not comply with the rule	22%	19%	13%	2%	2%	1%	0%	1%	<b>7%</b>
Checkpoints that comply with the rule	78%	81%	87%	98%	98%	99%	100%	99%	<b>93%</b>
Base	27,647	67,090	67,851	73,826	72,486	70,834	72,629	22,357	<b>474,720</b>

\*2010 starts from 25 July, as this is when vehicles stopped and controlled field came in; 2017 goes as far as 10 April.

Assuming that the same recording practices prevailed at GISC between 2010 and 2012, we would expect the proportion of additional breath tests as a result of applying the rule to remain similar to the proportion calculated in the first 6 months of 2012 - 0.42%. The number of breath tests at MAT/MIT checkpoints recorded on PULSE between 25 July 2010 and end of December 2012 was 1,288,349. Thus we could estimate that approximately **5,411** of these breath tests are over-recorded and are an artefact of GISC matching the numbers between the vehicles stopped and controlled and breath test fields.

As there was a change in the recording practices in November 2012, we cannot assume that the same proportion of over-recording as in the first 6 months of 2012 would apply to the later years. While we could speculate that more checkpoints might have been amended to comply with the rule post-2012, a higher number entered with matching numbers between the vehicles stopped and controlled and breath test fields is equally likely.

There is an additional issue to consider in relation to the vehicles stopped and controlled field, which was uncovered while listening to the incident voice recordings during the second visit to GISC in June 2017.

We learned that GISC call-takers didn't always ask members about the number of breath tests they had conducted. In some calls, they only asked for the number of vehicles they had stopped and controlled, and if all breath tests had been negative. Failure to ask about the number of motorists that had

been breath tested, and presuming that the number of vehicles stopped and controlled was the same as the number of negative breath tests might have led to the inflation of negative breath tests on PULSE at the point of data entry, which we cannot detect just by looking at the data.

Based on the feedback received as part of this examination, there was confusion, at least among some of the members, in relation to the vehicles stopped and controlled field. Therefore, some members may have reported inaccurate or incorrect figures for the number of vehicles stopped and controlled, based on their lack of understanding/misinterpretation of the field. If GISC then equated these figures to the number of negative breath tests without asking the member how many negative breath tests they had actually conducted, this would have resulted in the inflation of negative breath tests. In such cases, the information entered on PULSE would have been correct, as it would have complied with the rule that the number of vehicles stopped and controlled was equal to the sum of positive, negative and failed/refused breath tests. However, it would have been invalid. Unfortunately, we cannot tell whether the figures entered under the “MIT Statistics” tab on PULSE are valid or not without listening to the incident voice recordings.

It is not clear what the scale of this problem is; however, it certainly is an issue for at least some of the MAT/MIT checkpoints recorded on PULSE.